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ST ENGINEERING
BRARY

May 29, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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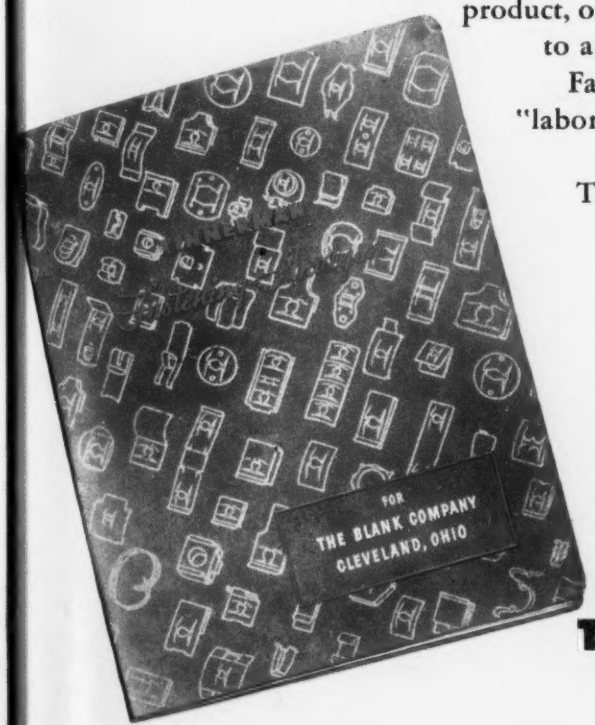

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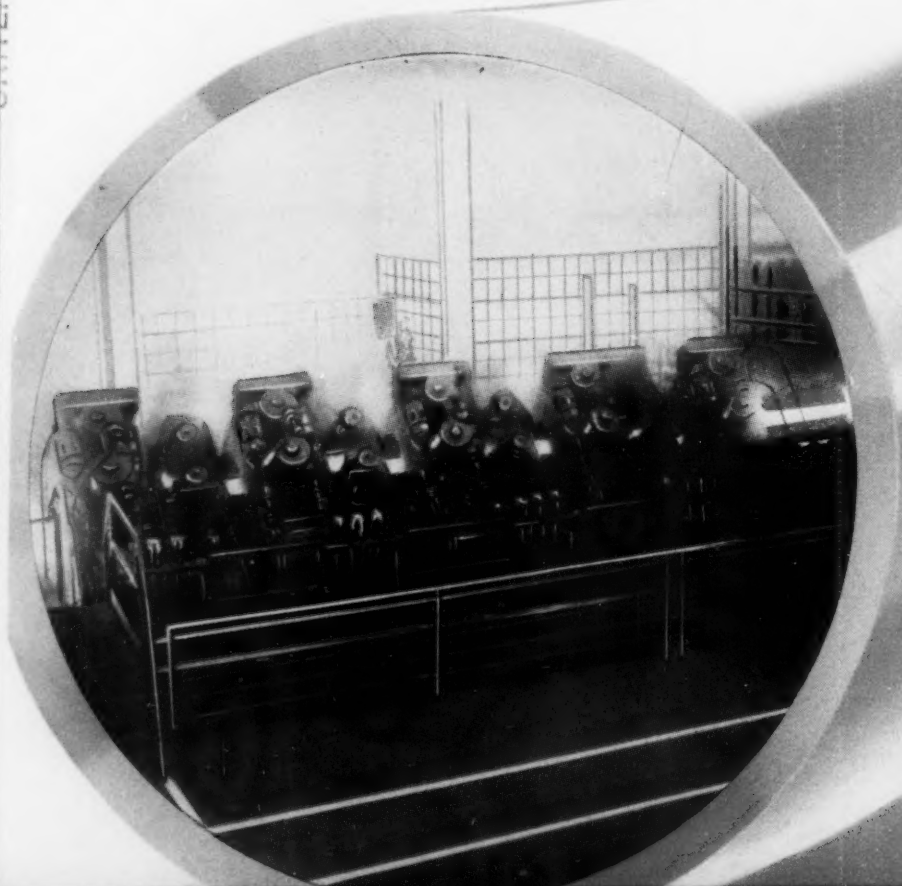

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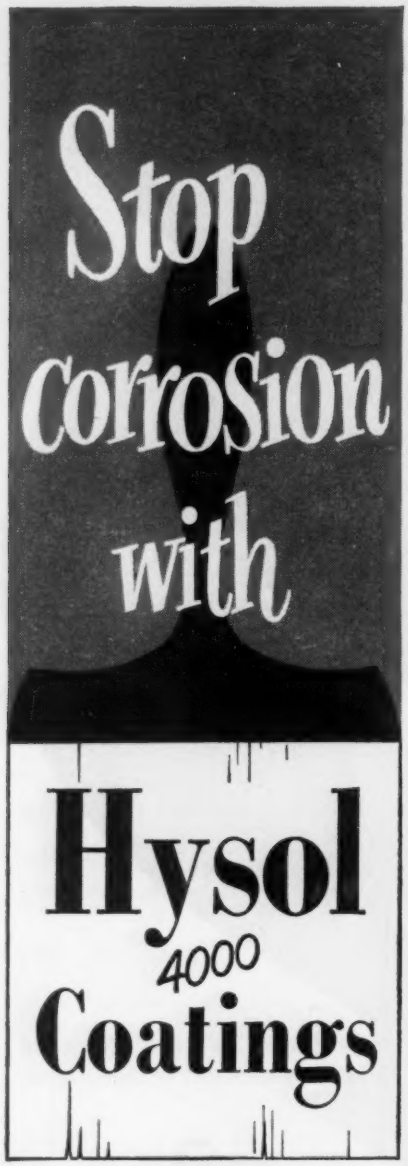

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Behind the Scenes . . .

Provocative

We hadn't given much thought to the coming vacation season until we started looking through some of the ads for this issue.

Nicholson File Co. had a headline that stopped us: Sunset Over the Rockies? After we had discovered what a Rocky Mountain sunset has to do with files, our mind began wandering. We got it back in check and kept it there until we came across an ad for Veeder-Root Inc.'s counters. What do counters have to do with our vacation? Absolutely nothing. It's just that we found ourselves counting the days.

There Ought To Be a Law

There ought to be a law that all legal holidays fall on a Monday or Friday. A Tuesday Memorial Day is like a fifty-cent lunch—it's hard to remember that you had it.

We've taken a private poll on the matter and 99.7 per cent of the people we've queried favor the Monday-or-Friday plan. Geraldine, a cleaning woman in the building and our night editor, accounts for the 0.3 per cent margin by which we missed unanimous approval. "Let 'em fall where they want to," says she.

The editors, of course, backed us 100 per cent. By Tuesdays they're just getting into stride for the weekly writing stint. We've suggested that they keep up their tempo by devoting this Tuesday to a hot session at their home typewriters getting letters off to Congressmen in support of the scheme.

The Mail Goes Through

STEEL people who move the magazine on its way from the printing presses to the post office heartily endorse the holiday reform. No copies, of course, are actually mailed Tuesdays, but the boys usually devote the day to getting ready for the next mailing.

Every week one person takes an entire day to automatically address envelopes in which this magazine is mailed. The mailing list has between 300 to 350 changes a month. Another person spends one day a week just sorting envelopes by geographical area. When the magazine is ready for the actual mailing, a crew of six takes about seven hours to stuff the copies into envelopes and to put the envelopes into mail bags.

For every city that gets 15 or more copies, a separate bag is packed that is routed by the Post Office direct to the city before it is opened. An average copy of STEEL weighs 12½ to 13 ounces. The average copy travels 450 miles to its destination—although it may go only a short distance to Motch & Merryweather Machinery Co., in the same building as STEEL, or many thousands of miles to Tata Iron & Steel Co. at Jamshedpur, India.

Puzzle Corner

E. Buschow of Surface Combustion Corp. beat the railroad strike somehow and was the first in with an answer to the butcher problem of May 15. The butcher must use ½, 1½, 4½, 13½ and 40 pound weights.

Jake, our butcher friend, spends his Sundays rowing a boat. One Sunday he was rowing directly upstream. His son, George, sat in the bow flying a kite in the wind which was blowing in the same direction that the river was flowing, but twice as fast. The kite string broke as the kite was 110 yards behind the boat, allowing the kite to drift freely through the air for one minute and then falling into the river.

In spite of George's objections, Jake continued rowing upstream. But 5 minutes after the kite had hit the water, he turned the boat downstream. After 6 minutes of rowing downstream he saw that the kite was one-eighth of a mile away and gave up in disgust. What is the wind velocity, assuming that the oarsman's water speed is constant, that the kite travels exactly with the wind when floating in the air and with the river when floating in the water?

Shrdlu

(Editorial Index—page 21)

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STEEL

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But that is only one example. Cupro-nickel alloys have established outstanding service records in applications ashore as well as at sea. They serve in sugar mills, oil refineries and power plants . . . in vital parts of feed water heaters, condensers, evaporators and other heat exchangers . . . in oil coolers, stills, water boxes, piping, tanks, and other equipment.

Cupro-nickel alloys eliminate those hidden taxes on profits represented by maintenance, replacement expense, loss of heat transfer capacity and interruptions of operation resulting from corrosion.

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May 29, 1950

Steel Takes Offensive

Ever since the end of the war the American Iron & Steel Institute has been devoting an increasing amount of attention to the industry's problem of public relations. At general meetings of the institute in recent years Edward L. Ryerson, Walter S. Tower, Clarence B. Randall and others have emphasized strongly the need of a better understanding of the steel industry by its employees, customers and the public.

As a result of this emphasis, a lot of time, money and effort has been spent by steel companies—collectively and individually—to win a higher position in public favor. While marked progress has been made in some respects, there still is a widespread feeling inside and outside of the industry that its public relations efforts are not clicking as they should.

In his address at the 58th general meeting of the institute in New York last Thursday, Hiland G. Batcheller, chairman of Allegheny Ludlum Steel Corp., proposed a new approach to the problem. He declares that "old line, conservative policies—the gentlemanly, pacifist attitude—will not bring any greater success in the future than they have in the past." He proposes that the industry take a bold offensive against the enemies of the steel industry who attempt to strangle it by parading its executives before government investigating committees, baiting steelmakers for failing to build more capacity, attacking their profits, picturing them as selfish and dangerous and threatening to put government into the steel business and to treat steelmaking as if it were a public utility.

Mr. Batcheller says "we're going to have to start slugging and the minute we do, I am sure we will find more and more of the American people in our corner cheering us on."

We believe the steel industry is ripe for this kind of counter-offensive. A & P is gaining public favor by its fight against antitrust lawyers. Dupont gained stature by its forthright stand against government attack against its bigness. Benjamin Fairless won new friends for United States Steel by his fighting speeches at Baltimore and Boston.

The political attackers of successful business have gone too far. They have goaded their victims into action. Now is the time to strike back boldly and vigorously.

* * *

A PRICELESS FORMULA: Best news of the week was the joint announcement last Tuesday by Harry W. Anderson, General Motors vice president in charge of labor relations, and Walter Reuther, UAW-CIO president, that company and union had agreed upon a five-year contract.

Examination of the terms of the agreement reveal no overwhelming "victory" nor any serious loss of "face," rights or prerogatives for either side. At the same time there is abundant evidence of "give and take" by both parties. From the statements of the principals, it is apparent that management and union leadership alike believe that the advantages of the new pact outweigh any points that were sacrificed.

The prompt, quiet and harmonious manner in which the General Motors negotiations were conducted is in sharp contrast to recent labor relations experience. No barrage of charges and counter charges was loosed publicly. No presidential "fact finding" panel horned in on the proceedings. Unwanted outside "mediators" were not prominently in the picture. There was

(OVER)

no strike and no loss of pay or loss of production. The smoothness of the entire transaction revives the hope that the art of true collective bargaining can be restored.

Labor relations experts from the management side and from the union side will do well to study the technique employed in the GM negotiations. What factors contributing to their success were lacking in the disastrous steel, coal, railroad firemen and Chrysler strikes? Answer that question and you have a priceless formula. —p. 33

* * *

"COST-PLUS" PRICING: Mill supply men are pretty good judges of business weather. They are sensitive to changes in the buying moods of industrial consumers. At the Triple Mill Supply convention in Atlantic City last week, 2500 manufacturers and distributors listened to speakers who envisioned an immediate future characterized by creeping inflation with attendant higher prices and wages.

Today new orders on books of supply dealers and machinery manufacturers are running 30 per cent ahead of the 1949 average. Distributors note a definite trend toward decentralization of industry. In 1940 twenty-five cities accounted for 51 per cent of industrial supply sales. Last year the figure was 48 per cent.

Net profits to distributors are tending downward. Some authorities attribute this to the fact "too many distributors are still operating on a basis of cost-plus pricing." Mill supply men have no monopoly on this practice. It is all too prevalent throughout the metalworking industries. —p. 35

* * *

NEW SKIN FOR AIRCRAFT: Do you remember when window glass was made by blowing a glass cylinder, cutting off the ends, slitting the remaining tube longitudinally and permitting the hot glass to unbend onto a flat surface? By a new process, an internally ribbed aluminum tube is extruded hot from a hydraulic press, straightened and stretched slightly beyond its elastic limit, slit longitudinally, opened up and flattened.

The resultant integrally stiffened aluminum sheet may permit the aircraft industry to build airplane wings, fuselages and floors without internal spar bracings. If so, weight of these structures will be cut 10 per cent, number of attachment operations and of separate parts will be reduced 60 per cent, cost will be lowered 10 per cent and a substantial volume of aluminum ingot capacity and machine tool capacity will be conserved. —p. 63

* * *

CONSERVING RESOURCES: Two authors, writing on the subject of how proper coke oven refractories reduce overhead costs, cite impressive statistics to emphasize the tremendous advantage of the modern by-product coke oven over previous means of providing fuel for blast furnaces and cupolas.

If the nation still were dependent upon charcoal for this fuel, a belt of cordwood 2 miles wide by 4 feet high spanning the continent from New York to San Francisco would have been required to furnish charcoal for the 2 billion tons of pig iron produced in the nation since 1875.

In World War II the larger improved by-product ovens averaged 12 tons per day against a little over one ton for beehive ovens. More important is the fact that the various by-products, pound for pound, are a trifle more valuable than the main product—coke. Truly, our batteries of by-product ovens constitute one of the nation's major agencies for conserving its natural resources. —p. 65

* * *

ELECTRONICS IN STEEL: Among the 12 technical papers presented at the general meeting of the American Iron & Steel Institute last Wednesday were four dealing with the application of electronics to operations in the steel industry. The four authors—Richard W. Barnitz, L. A. Umansky, W. R. Harris and A. L. Ellis cited numerous instances where electronic devices will pay off in difficult operations or where the overall cost for doing the same job is less.

Electronics have found special favor in various types of continuous mills and processes. It is believed that the modern, high speed electrolytic tin plating line utilizes more different types of electronic apparatus than any other single application in the steel industry. Devices employed include a plating current-speed regulator to assure proper coating of tin, high frequency induction heating to reflow tin, photoelectric scanner system to control the flow line and photoelectric loop regulators, several of which may be required depending upon the layout of the line. —p. 74

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

SLUGGING IT OUT—There's a new attitude in industry toward the government. It has been expressed several times in the past few weeks by industrial leaders, but last week speakers at the American Iron & Steel Institute meeting served formal notice that industry will no longer take the conservative, passive attitude toward government policies that are leading to creeping socialism (p. 29). Hiland G. Batcheller, Allegheny Ludlum Steel Corp. chairman who has held high government posts in emergency times, says the government's attack upon individual freedoms and free enterprise is a greater danger than a war with Communism. Institute President Walter S. Tower says industry can function well only if there are: Less government attacks, less effort to siphon off the profits of industry, less lip service to the "little man," less federal bias in favor of labor.

SECOND THE MOTION—Charles M. White, Republic Steel Corp. president, reaffirmed those sentiments when he spoke before the National Industrial Conference Board (p. 31). He says "the chief obstacle to industrial expansion is the government." He attacks excessive taxation, deficit spending, wasteful government operations, bitter antagonism against business, government competition in business and an obsolete depreciation policy.

YOU CAN'T WIN—Republic's Chairman Tom Girdler carried the ball on depreciation when he spoke to the Controllers Institute of America (p. 32). He charges that the government has a "heads I win, tails you lose" policy toward depreciation that is creating exaggerated ideas of industrial prosperity in the midst of inflation.

FIVE-YEAR LABOR PEACE?—GM President C. E. Wilson says (p. 33) the new GM labor pact affecting 270,000 hourly employees will help stabilize "not only our business but the economy of the whole country. We believe that removing the fear of a strike for five years is a tremendously constructive achievement." In the contract the cost-of-living wage formula provision is retained that permits no reopening until 1955.

FAIR AND WARMER—The GM settlement won't hurt the business boom one bit (pp. 46-49). Autos and steelmaking operations continue to set a torrid pace. STEEL's industrial production index holds at the stratospheric 204. Sales potentials mount for companies that make industrial and domestic equipment using gas because a large pipe line construction program may soon make natural gas available in every major city of the U.S. Both gas and electric appliance sales are climbing. Not all is rosy, though. Prices are rising; railroad earnings and carloadings are falling as industry produces and ships at a record rate.

WAY AHEAD—Manufacturers and distributors of industrial supplies and equipment are happy because their sales are running 30 per cent ahead of the 1949 average (p. 35). Speakers at the Triple Mill Supply meeting expect continued good business, but prospects are for creeping inflation, with higher prices and wages.

CARTELS RIDE HIGH—European cartel interests are delighted by an unexpected bonus (p. 40). Although the origins of the plan for a common economic policy for French and German heavy industries were political, not industrial, the scheme jibes nicely with trust interests' philosophy of controlled markets and planned production.

HERE AND THERE IN INDUSTRY—Metals and their manufactures constitute 39 per cent of the dollar value of exports from this country (p. 41) . . . June 5 is the last time that notices of appearances at the tariff hearings scheduled to begin June 19 will be received (p. 41) . . . The Defense Department is studying how prices on military items can be held down (p. 36) . . . Buick is turning out 2200 engines a day, far beyond anything ever achieved before (p. 43) . . . Machinery & Allied Products Institute is holding a series of regional meetings to show industry how to use its equipment replacement formula (p. 32).

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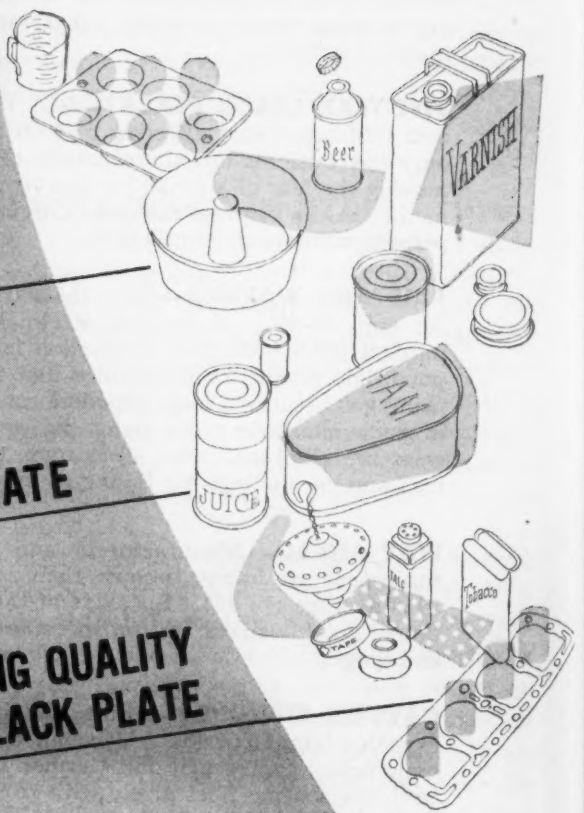

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STEEL
A PENTON PUBLICATION

Time To Start Slugging Back

Forget old-line pacifism in favor of more aggressive tactics, American Iron & Steel Institute members advised. Or face creeping strangulation by government control

INDUSTRY must adopt more aggressive tactics and "start slugging" in its battle against the "creeping strangulation of government interference and control."

This statement by Hiland G. Batcheller, Allegheny Ludlum's chairman, echoed through the Waldorf-Astoria in New York last week where the American Iron & Steel Institute was holding its 58th general meeting.

The new aggressive attitude by business is becoming increasingly evident. Food chains, oil companies and steel executives indicate they are ready, willing and able to fight back.

Pacifism Is Out—"Old line, conservative tactics—the gentlemanly pacifist attitude—will not," Mr. Batcheller asserts, "bring any greater success in the future than they have in the past.

"Which is more important, preserving our dignity or preserving free enterprise and thus preserving this nation?" asks Mr. Batcheller, who believes socialization of the steel industry ultimately would lead to socialization of all major industries.

No. 1 Threat—Mr. Batcheller holds the attack upon individual freedoms and the systems of free enterprise presents a far greater danger than a war with communism, which, he says, will be won if industry in this country is permitted to retain its flexibility and freedom of action.

"Ever since the end of the war, the steel industry has been paraded before one government committee after another. The steel executive has been persistently baited for failure to build more capacity, his so-called profits have been attacked, the location of new plants is a subject of political pressure, he is hauled back and forth on his wage policies, his prestige is persistently battered, his motives are pictured as selfish and dangerous, he is accused of callous and sinister indifference to the public welfare and threatened with dire consequences if he does not lower prices, embark on a wild building spree, put a plant here, put a plant there, raise wages, and guarantee all the social services and securities the human mind can dream up.

Love and Devotion—"This attack on our industry has been both direct and oblique, and forever accompanied by repeated protestations of devotion to the free enterprise system and solicitude for its preservation.

"What makes this attack all the more unreasonable is that the steel industry has turned in a decade of phenomenal production and expansion."

Fighting Policy — Mr. Batcheller's call for action is endorsed by E. L. Ryerson, Inland Steel's chairman and head of the institute's public relations committee. Although this fighting policy can be pursued by the institute and the companies, Mr. Ryerson says individuals in the industry must carry it to the grass roots.

Fifty Years in Steel—Walter S. Tower devoted a large part of the President's address to changes which have taken place in the steel industry since 1900, and the problems faced by the industry during the past half century.

Lately, the industry has had to face more problems arising from outside its operations. These relate to the economic and social aspects of industrial activity, as government and national labor unions, with their growing dictatorial tendencies, have reached for more and more elements in the life of the country.

Changes Are Needed—If the industry is to function to the best advantage of the country, Mr. Tower believes some changes are necessary. He suggests these:

Less of government attacks on industry, more acceptance of the importance of industry to national welfare.

Less effort to limit or to siphon off the profits of industry, more appreciation of the twin facts that only profitable industry can be healthy and grow, and that healthy growth is the way to more jobs at good wages.

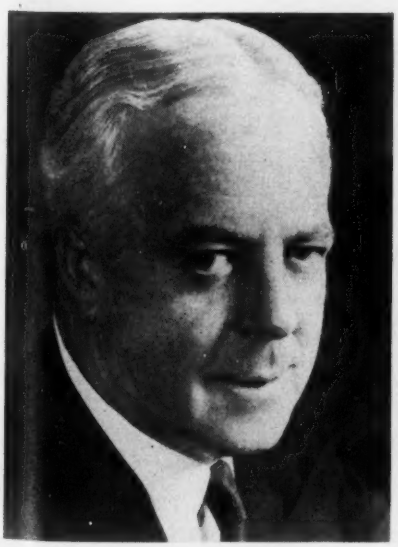
Less pretense that there is some special merit in small size, more realization that both the size of this country and the habits of its people require big industry with expensive equipment and great capital resources.

Less hollow lip service to the "little man," more honest intention to give small ventures a fair chance to survive and grow.

Less weight of government thrown to the support of labor leaders' demands, more consideration for private capital which has provided the tools for fabulous productivity.

Less desire to get the hand of government into the affairs of industry, more recognition of what private enterprise and able management have contributed in the amazing progress and strength of this nation.

Freedom for Research—The iron and steel industry, developed into a



H. G. BATCHELLER
. . . time to start slugging

DR. R. E. ZIMMERMAN
. . . steel research helps customers

strong technical position by wide research, must be kept free from unfitting regulations which would curb large expenditures for long range planning. This is a conclusion by Dr. Edward R. Weidlein, director, Mellon Institute, Pittsburgh, who delivered the fourth annual Charles M. Schwab Memorial lecture.

The large size of this industry, which strengthens the whole economy, has come from the wide application of science and engineering in a free enterprise system, says Dr. Weidlein.

"Industrial research has left its indelible mark on our social and economic standards. Present trends in this field point to the more efficient use of metals from the standpoint of strength and high resistance to corrosion as dictated by the aviation industry and by the depletion of the rich ore deposits."

Atomic Alloys—"New metallic products must be developed to meet the requirements of nuclear energy plants of the future. In line with the new air force, alloys that will stand high stresses and corrosive influences at high temperatures will be evolved for improved jet-engine performance. The continued use of oxygen enrichment is foreseen for high production and greater efficiencies in the melting phases of ferrometallurgy. The purging of molten metal by the use of inert gases appears to have aroused considerable interest.

"There are many unsolved problems in all fields of research, and ferrous metallurgy is no exception."

Schwab Dared To Lead—Dr. Weidlein cited the daring of the late Charles M. Schwab as a characteristic of the steel industry. In a day when

DR. E. R. WEIDLEIN
. . . keep industry free

many industrial leaders were skeptical of the practical possibilities of chemistry, Mr. Schwab was a leader in adopting it in the steel industry. Mr. Schwab borrowed $1000 in order to install in his home a laboratory where he could study steel. In this way, he convinced executives of its value to the industry. Mr. Schwab's work amazed even Capt. Billy Jones, a famous steelmaster who previously had remarked that, "Chemistry is going to ruin the steel industry."

Partners in Progress—Applied research and industrial progress go hand in hand, and in that partnership is much economic strength, says Dr. R. E. Zimmerman, vice president-research and technology, United States Steel Corp.

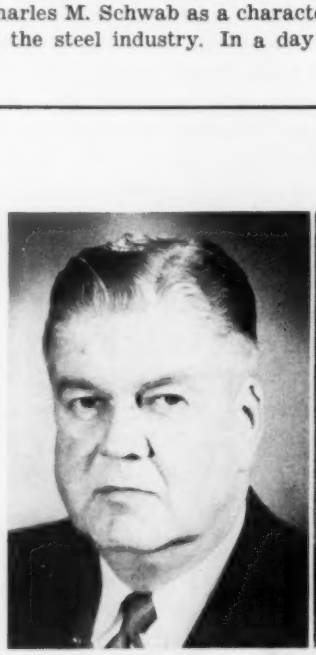
Economic strength, in turn, is the bulwark of security.

"One of the most valuable attributes of research in the steel industry is that it is not confined exclusively to the steel industry . . . The products of the steel mills are largely capital goods, subsequently fabricated and used in many industries . . . an important part of steel research is devoted to study and understanding of the processes and service requirements of the customers in order that various grades of steel may be adjusted to the jobs at hand."

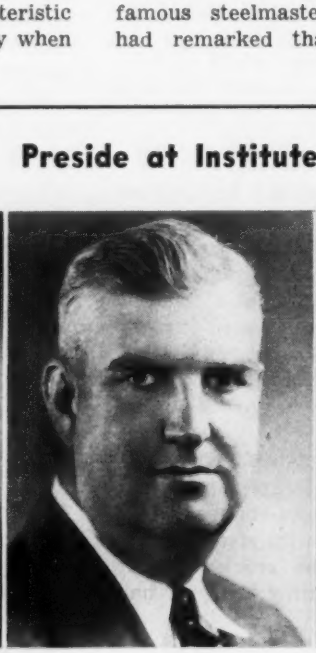
Many Problems Ahead—Although research and development have been prosecuted extensively, "what is past is but prologue to the future," says Dr. Zimmerman. "Ahead of us we have such matters as a continuation of the prolonged battle against corrosion, the effort to control mounting percentages of sulphur coming from metallurgical coal, the improvement of processes for the beneficiation of lean iron ores, and an exhaustive exploration of the wider use of oxygen in smelting and refining."

Awarded Institute Medal—Donald E. Babcock, metallurgical engineer, Republic Steel Corp., was awarded the American Iron & Steel Institute Medal for his paper on "Sulphur Control and Manganese Conservation in Open Hearth Furnaces," presented at the 1949 institute meeting. The in-

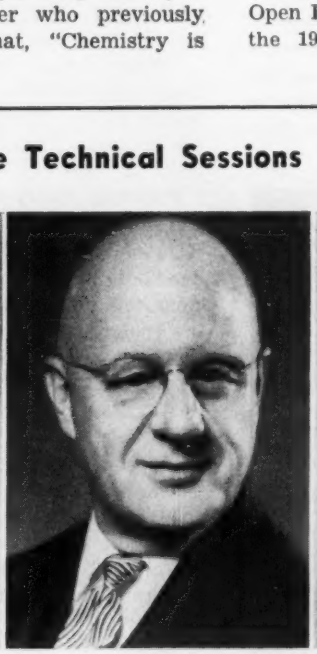
Preside at Institute Technical Sessions



W. F. MUNFORD
American Steel & Wire Co.
(Raw Materials, Operations)



H. W. JOHNSON
Inland Steel Co.
(Electronic Controls)



F. H. FANNING
Armco Steel Corp.
(Testing and Inspection)

A. F. FRANZ
Colorado Fuel & Iron Corp.
(Shipping Problems)

DON E. BABCOCK
. . . wins Institute Medal

stitute Medal was established in 1927.

Two Years of Peace—Best result obtained from the present contract between the coal industry and the United Mine Workers is that we can look forward to two years of peace. This period should be used by every segment of the industry—owners, managers, investors and suppliers—to remove coal labor relations from the area of slap-stick and low comedy. Future labor relations should be divorced from government and court control.

So says Harry M. Moses, president, H. C. Frick Coke Co., who spoke at the labor relations session.

Mr. Moses denies coal is a sick industry. He says it is not even indisposed; it needs no Guffey or Kilgore bills; it never has needed subsidies; it can support its high wage scale, earn fair profits and supply itself with necessary tools and at the same time continue a model of free enterprise.

Members Confident — The 1200 members attending the institute sessions expressed high confidence over the business outlook for the summer. This was in marked contrast to the depressed attitudes at the 1949 meeting when steel demand was undergoing a decline.

Death of Charles Hart, one of the two remaining charter members of the institute, was announced by President Tower. The institute voiced an expression of deep regard for the man and his accomplishments. Mr. Hart, 81, was a former president of Inland Steel Co., and retired president of the Delaware Steel Co., Chester, Pa. He died May 23 at Bryn Mawr, Pa.

All institute officers were re-elected. Harold E. Stessen, president, University of Pennsylvania, was the banquet speaker.

Abstracts from papers presented at the four AISI technical sessions will be found on page 74, this issue.

"The Trouble Is . . ."

Government gets in the way of industrial expansion, Republic Steel president declares

WHAT'S THE MATTER with business? The government!

So says Charles M. White, president, Republic Steel Corp., Cleveland.

His vocal analysis of the obstacles in the path of business is additional evidence that industry and private enterprise are taking the offensive against government oppression. Only a few weeks ago Benjamin F. Fairless, president, United States Steel Corp., in his "the right to be right" talk at Boston voiced criticism of government policies (STEEL, May 22, p. 47).

Both Mr. White and Mr. Fairless have frequently been in defensive roles before congressional groups "investigating" business, particularly big business, and more particularly the steel industry.

Jab to the Leftists—In making his verbal jabs at certain government policies Mr. White was discussing "Economic Expansion: Promise vs. Performance," the topic of the 34th annual meeting of the National Industrial Conference Board in New York. The topic was a fitting one for "economic expansion" has been the administration's theme song.

"Industry," said Mr. White, "is fully conscious of the possibilities of expanding our economy, but faces real and difficult problems." The problems and barriers can be summed up with one word, he pointed out. He did it with this statement: "The chief obstacle to industrial expansion today is the 'Government.'

"This sounds like a broad statement but it is exactly what I mean. It is government policies which have painstakingly built the obstacles that confront American business.

Stumbling Blocks—"Let me enumerate some of those dangerous policies: 1. A taxation policy which is almost confiscatory in its effect; 2. a policy on depreciation which sharply limits industry's efforts to expand and modernize; 3. a policy of extravagant, wasteful governmental operation; 4. a policy of deficit spending which throws a dark cloud over the financial stability of our country; 5. a bitter antagonism to any business which has grown big because it has served its customers and the nation well; 6. a policy which encourages legislation that holds the threat of increased and widespread government competition to business; 7. a policy of coddling some groups for political advantage; and 8. a policy of discrediting business by badgering it."

If business management can be intimidated, can be thoroughly cowed, the road to nationalization will be smoother, Mr. White explained. "The steel industry has been the particular target of congressional investigations. If steel were nationalized, the balance of the job would be easier.

On With the Fight—"I have been proud of the sharp protests made by steel executives against this governmental procedure. Especially am I proud of Ben Fairless. I have had some small part in these protests myself and will continue to expose the unsound economic theories which, if carried through, would result in the downfall of this country."

The NICB elected Neal Dow Becker chairman. He is president of Intertype Corp., Brooklyn, N. Y. Others elected are: Chairman of trustees, Cola G. Parker, president, Kimberly-Clark Corp., Neenah, Wis.; and vice chairman of the board, James D. Wise, president, Bigelow-Sanford Carpet Co. Inc., New York.

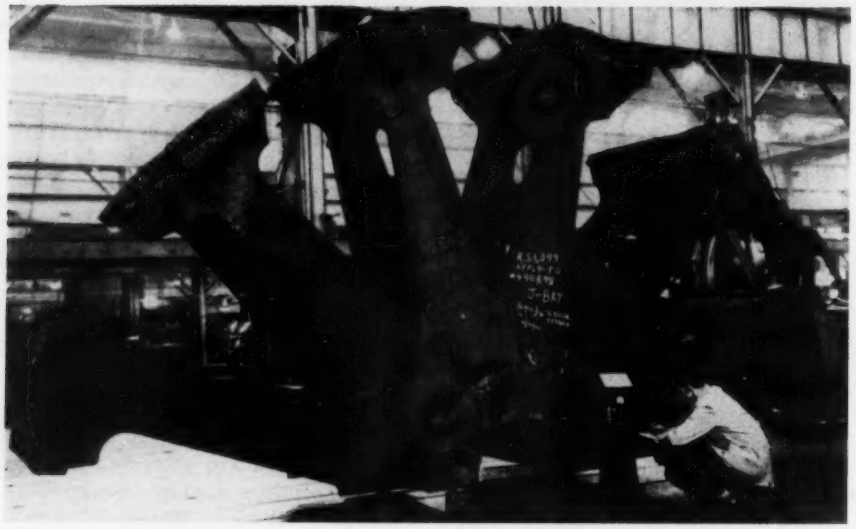
New trustees for terms ending in 1953 are: S. Bayard Colgate, chairman, Colgate-Palmolive-Peet Co., Jersey City, N. J.; W. W. Bodine, chairman, Penn-Mutual Life Insurance Co., Philadelphia; and Charles J. Stilwell, president, Warner & Swasey Co., Cleveland.

Steelworkers Seek Union Shop

A drive for union shops in basic steel and steel fabricating companies in the Chicago area is being planned by the United Steelworkers of America—CIO. Joseph Germano, director, District 31, has announced the campaign will open July 1. This echoes the program advocated by Philip Murray at the steelworkers' convention.

Industrial relations director of one steel company in the Calumet area thinks the union shop issue will assume more importance when present contracts expire, and that the union's announcement at this time is preparatory to an educational campaign which it will conduct. Already, he says, schools have been started by the union to drive home to workers the need for union shop conditions.

Under the Taft-Hartley law a majority vote of eligible workers is required before the union shop subject is bargainable.



STRAIN GAGES: Here's how a huge 35-ton steel casting is weighed by Baldwin Locomotive Works, Philadelphia: Resistance wire strain gages are bonded to short vertical columns incorporated in three load cells of 50,000 pounds of capacity each. The cells were developed for accurate weighing of all kinds. The casting is a semirotor that will be shipped to a hydroelectric plant in Canada

'Heads I Win, Tails You Lose' Policy

That's what Tom Girdler calls the government's attitude toward depreciation. And it makes it rough for the steel industry with its large capital expenditures

THE GOVERNMENT has a "heads I win, tails you lose" policy toward depreciation, charges Tom M. Girdler, chairman of Republic Steel Corp.

Speaking in Louisville, Ky., before the Controllers Institute of America, Mr. Girdler blamed short-sighted government regulations regarding depreciation for creating exaggerated ideas of industrial prosperity in the midst of inflation. (For a basic study of depreciation and its effects on industry, see STEEL, May 8, p. 53).

Profit Erosion—"You can't make me believe that a company has made $1000 profit when it has to spend $300 to replace a piece of equipment which originally cost $100 and on which the government has allowed it to take only $100 depreciation," he says. "That extra $200 has certainly reduced the $1000 profit to $800."

The situation is particularly serious in the steel business and other types of enterprise that require large plant investments. Mr. Girdler points out that Republic is now building a power plant that will cost seven times as much as the facilities it will replace. From 1946 to 1949, Republic spent $46 million more, largely for replacements, than the depreciation allowed by the government. That $46 million must come out of profits.

Distorted Picture—Mr. Girdler reports that "the damage done by this overstatement of profits is tremendous and far-reaching. The union leaders quote our profit figures as though they were made up of prewar dollars. Using these false profits as a base, they make excessive demands on behalf of their members. Politicians find in these fictitious profits a reason for price control."

Challenging the controllers of the nation's business to work for a more realistic approach to depreciation allowances, Mr. Girdler calls for the development of legislation which will permit business "to make its tax returns according to the facts and not according to an out-of-date accounting method." He wants the government to permit a depreciation allowance based on today's replacement prices. The Bureau of Internal Revenue now requires that industry must depreciate on the original cost.

When To Replace Machinery?

Several hundred industrial executives from the New York area were coached May 23 in applying a formula to determine when to replace worn-out or obsolete machines.

They attended a regional meeting of Machinery & Allied Products Institute at the Waldorf-Astoria. The meeting is one of a series being held in principal cities to put the institute's recommendations on scientific replacement into practical use in industry. The MAPI formula is one tool designed to help industry solve its depreciation problems (STEEL, May 8, p. 53).

Duncan J. Stewart, vice president of Barber-Colman Co., Rockford, Ill., described application of the MAPI formula in his own company. He emphasized the costliness of continuing to use machinery which should be replaced. In his company a small staff of analysts is charged with the responsibility of keeping the management advised on needed replacements. It is this staff's duty not only to know the performance of present equipment, but also to be familiar with the best available alternative.

"One weakness in replacement," said Mr. Stewart, "is that management fails to investigate sufficiently all possible alternatives. We consider replacing one machine with another like it when we also ought to look into the possibility of doing the machine's job in some entirely new way."

Business and industrial construction has been at low tide during the postwar period of record-breaking business activity in other lines, according to an analysis made by machinery & Allied Products Institute.

MAPI Says Construction Lags

Business construction, in terms of constant dollars, has averaged lower in recent years than it did 20 years earlier despite the population growth and increased industrial activity, MAPI finds.

In charting plant expenditures and equipment expenditures, it finds a similar lag. Computed at constant prices, equipment expenditures for the five years from 1946 to 1950 were up nearly 150 per cent from the five-year period from 1926 to 1930. But plant expenditures were 10 per cent lower in the postwar period than in the late 1920s. Prior to 1930, plant expenditures constituted about 40 per cent of total fixed capital outlays, but now they are only about 25 per cent.

MAPI says that the construction lag can be explained at least partly by: Economies in use of space; the high cost of construction; shortage of special capital to finance expensive building; a decline in the growth of the country's labor force that makes less necessary the physical expansion rate of the 1920s.

Tool Engineers Pick '52 Site

The Chicago Amphitheatre was selected as the site of the 1952 Industrial Exposition by the American Society of Tool Engineers. The exposition is scheduled for the week of Mar. 17, 1952.

The 1950 exposition in Philadelphia topped previous records for the show.

UNIVERSITY OF MICHIGAN LIBRARIES

GM-UAW Pact Promises 5-Year Peace

Cost-of-living formula retained in contract that permits no reopening until 1955. Annual improvement factor raised. Pensions may be increased if social security is liberalized

SINCE March 29 when new contract negotiations were started between General Motors and the UAW-CIO, 35 joint meetings were held. In the ten days before the announcement of a new five-year contract, characterized by C. E. Wilson, GM president, as "unprecedented in labor-management relations," bargaining sessions lasted just 100 hours. Last Tuesday a hurry-up call went out to newsmen to assemble at the General Motors building at 1:45 p.m. Everybody knew: This is it.

The contract was all wrapped up. Harry W. Anderson, GM vice president in charge of labor relations, read a statement. Walter Reuther, UAW-CIO president, read a statement. Cameras clicked under klieg lights. Pencils scribbled. Everybody shook hands and smiled. The job was done.

What's in the agreement that was worked out with such apparent smoothness? Briefly:

1. **Cost-of-living formula** continued. First set up two years ago, the formula provides for wages to be reviewed quarterly and adjusted in line with changes in the consumer price index of the Bureau of Labor Statistics (The UAW had demanded scrapping of this formula).

2. **Annual improvement factor** of 4 cents per hour (as against the former 3 cents) to be added to base rates starting May 29, 1950, and 4 cents additional added annually for the life of the contract.

3. **Funded noncontributory pension** plan providing a minimum of $100 per month, including federal social security, for all employees with 25 years of service. If federal social security is increased, pensions will exceed $100 monthly for most employees, since GM pension contributions will continue to be not less than $1.50 per month for each year of service up to 30 years.

4. **Increased life insurance** and sickness and accident benefits at no additional cost to employees. GM will bear half the cost of hospitalization, and surgical coverage for the employee and his family.

5. **Amended union security** provisions calling for employees not members of the UAW now to be free from paying any dues and assessments for the life of the agreement; employees now members to continue to pay dues and assessments as a condition of employment; and any new employees, after acquiring seniority by working 90 days, required to join the UAW and pay dues and assessments for at least one year, after which they may withdraw or not, without affecting employment status.

Other minor changes include wage adjustments for certain skilled classifications, raising rates of tool and die makers and certain other groups by 5 cents an hour, plus the annual improvement factor; liberalized plan for pay in lieu of vacations—40 hours pay to employees with one year of seniority, 60 hours for three to five years, 80 hours for five to 15 years, and 120 hours for more than 15 years.

A Funded Plan — The retirement program is to be trusteed and the plan is to be funded on a 30-year basis; a joint committee is to be set up to pass on eligibility. Effective date of pensions is Oct. 1, and no retirements, except at the option of the employee, will be required until Jan. 1, 1952. Normal retirement age is 65 but the employee optionally may continue if able until 68. At the option of the corporation he may continue beyond 68 if possessing unusual skill and good health.

Under the new agreement life insurance will range from $2500 to $5000, and sickness and accident benefits will range from $28 per week to $45.50 per week up to 26 weeks. The corporation will reimburse employees for doctors' visits in hospitals not to exceed $5 per day for a maximum of 70 days for each confinement.

Five Year Peace Pact—Mr. Wilson said he believed the agreement, covering approximately 270,000 hourly rated employes, will have a stabilizing influence "not only on our business but on the economy of the whole country.

"We also believe that removing the fear or possibility of a strike for five years is a tremendously constructive achievement for our employees and their families, our business, our dealers, our suppliers and the general public. The settlement should mean that all concerned can face the future with added confidence."

Mr. Reuther concluded that the agreement, "in which improved technology is translated into higher living standards, represents the groundwork upon which future collective bargaining must build if we are to achieve a balance between purchasing power and productive power in a dynamic, expanding free economy."

Call it what you will—industrial statesmanship of a high order, astute industrial and public relations, calm and forceful collective bargaining, etc., at least everyone wound up happy and the danger of any tieup in record-breaking production levels of GM divisions looks to be averted for five years.

GM common stock responded with a leap of about $4 a share within hours after the agreement was announced.

NEA

HAPPY FACES IN A HAPPY CITY
. . . UAW's Reuther and Johnstone, GM's Anderson and Seaton

TCI Plans Ore Terminal

Purchases site on Mobile river to handle imports from U. S. Steel's Venezuelan project

SITE for an iron ore terminal at Mobile, Ala., has been purchased by Tennessee Coal, Iron & Railroad Co., a United States Steel Corp. subsidiary.

The 36-acre tract will be developed and improved for use as a terminal to handle imports of foreign ore for use in the company's steelmaking operations in the Birmingham district. Located along Mobile river, the site is occupied by Turner Terminal Co.

Time when the improvements will be made is indefinite. They will be related closely to U. S. Steel's iron ore developments in Venezuela, and the facilities to be installed at Mobile will have to coincide with plans not yet determined for shipment of ore from the South American country. Meanwhile, TCI will continue to handle ore from Sweden and South America through its facilities on Blakely island on the east side of the Mobile river.

Ward's Sells Dayton Warehouse

Sale of the assets of the Dayton, O., operation of Edgar T. Ward's Sons Division to E. L. Gray, manager of the Dayton outlet, is announced by Columbia Steel & Shafting Co., parent organization.

Mr. Gray will continue the business at Dayton as a personal enterprise under the name of Ward Steel Service Co. at the same location and with the same personnel. He will also continue as district manager of sales of Columbia Steel & Shafting and Summerill Tubing Co., and will carry the products of these two companies in the stock of Ward Steel Service.

FTC-Steel Case To Be Reopened?

Richard P. Whiteley and Everette MacIntyre of the Federal Trade Commission legal staff have urged the commission to reject the respondents' proposal of settlement in the steel case. The steel companies involved want the matter settled with a consent decree without findings of fact.

The FTC lawyers ask the commission to reopen the case for the gathering of more evidence to show the nature, extent and effects of the old steel basing system; alleged agreement among respondents to forestall increases in steel production facilities; alleged collective action to forestall and prevent reductions in railroad freight rates; more data on pricing and production history of certain respondents; and more data on the terms and conditions of sales.

GAMA Elects Officers

Frederic O. Hess, president of Selas Corp. of America, will be the new president of Gas Appliance Manufacturers Association. He was elected May 28 at the annual meeting of the association in White Sulphur Springs, W. Va. Selas headquarters are in Philadelphia.

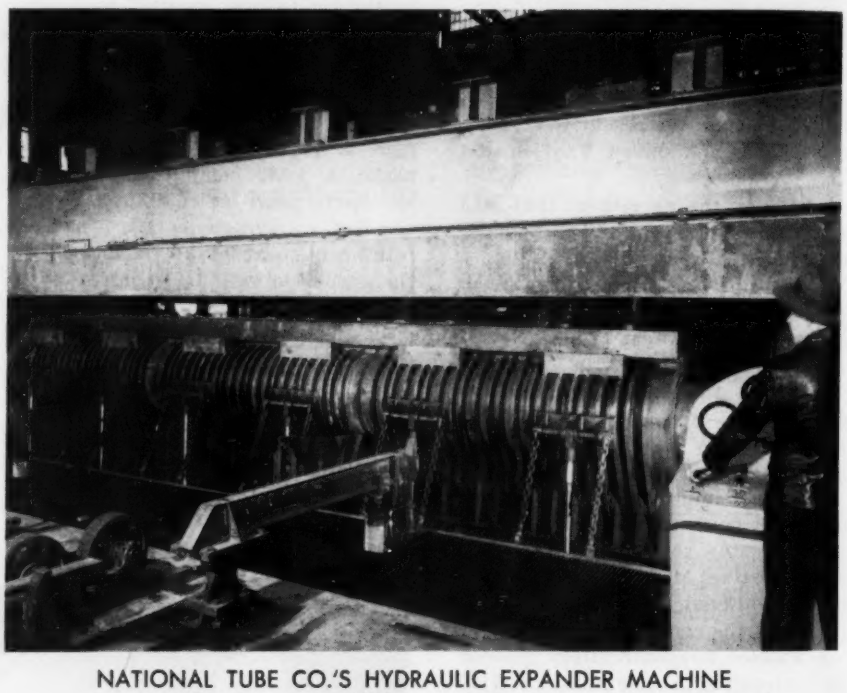
He and these other new officers will take office Oct. 1: First vice president, Louis Ruthenburg, chairman of the board of Servel Inc., Evansville, Ind.; second vice president, A. B. Ritzenthaler, vice president of Tappen Stove Co., Mansfield, O.; treasurer, Lyle C. Harvey, president of Bryant Heater Division and Affiliated Gas Equipment Inc., Cleveland; and secretary, H. Leigh Whitelaw.

Reynolds Buys Southern Firm

Reynolds Metals Co., Louisville, is exercising the option it took last July to purchase Southern States Iron Roofing Co., Savannah, Ga., and will take over controlling interest of the company June 30. Purchase price is reported to be around $2 million.

Southern States will continue to operate as a separate company under its present management. The company will continue to distribute its present line.

How To Expand Pipe Diameter Half an Inch



NATIONAL TUBE CO.'S HYDRAULIC EXPANDER MACHINE
. . . capable of exerting 3000 pounds of pressure per square inch

STEEL is strengthened while being expanded in the new electric welded pipe mill that U. S. Steel's National Tube Co. installed at McKeesport, Pa. The expansion-strengthening process takes place in a machine where the pipe is surrounded by curved dies that control the amount of expansion. Here's how it works:

After the pipe has gone through several operations—at U-ing and O-ing presses, welding machines, flux removers, inspection stations — men in the expander department get the pipe. It is lifted into the expander machine and a tapered ram is inserted in the end. A rubber gasket seal insures a water-tight connection. Next, a four section die, machined to the specified finished OD, is placed around the pipe. Then they turn the water on.

Thickness of the tube walls tells the operator at the pressure gage how much pressure to apply to expand the pipe to its correct size. As the pipe is enlarged in diameter, it is reduced in length (the plunger automatically advances to maintain a water-tight seal). Water pressure is then dropped below the yield point of the steel. Two end dies are opened; air hammers strike the pipe in testing. If no leaks appear, the other two dies are opened, pressure is again dropped and the entire seam is inspected visually for leaks. The pipe is now about ½ inch bigger in diameter than it was. Its next stop: A double end-facing machine.

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Mill Supply Business 30% Above 1949

Manufacturers and distributors, meeting in Atlantic City, predict continuing inflation. Higher labor costs, increasing federal expenditures forcing prices up

INDUSTRIAL supplies and equipment sales this year are running 30 per cent ahead of the 1949 average. Prospects are for creeping inflation with higher prices and wages.

That report on the outlook for business was heard by 2500 manufacturers and distributors meeting at Atlantic City, May 22-24.

New Orders Up—The new order index of the American Supply & Machinery Manufacturers' Association now stands at 115 and represents monthly sales of 142 companies, amounting to about $75 million. The index is based on July, 1948, as 100. One year later the index had dropped to 68 and averaged 87 for 1949.

Trends—Since prewar, a noticeable trend is evident in decentralization of industry. In 1940, twenty-five cities accounted for 51 per cent of industrial supply sales; last year the figure was 48 per cent.

Outlook—Ralph J. Cordiner, executive vice president, General Electric Co., Schenectady, N. Y., makes these predictions: "Prices generally in the predictable future will increase. All about you are indications of a gradual creeping inflationary trend; higher wages, either in cents per hour or, probably more particularly, increased social benefits such as pensions, insurance and health programs; an unbalanced federal budget and thus deficit spending; and high proportionate employment where approximately 93 per cent of all the people in this country desiring to work are gainfully employed. With years of pent-up demand due to the war not yet satisfied, these factors automatically point the way to higher prices."

Pricing—"Too many distributors are still operating on a basis of cost-plus pricing. In long established competitive business it is much sounder to set the price of a product in terms of intrinsic value," said Mr. Cordiner. "A sound pricing formula is a basic part of the whole marketing plan in distribution of industrial supplies and equipment."

Profits—Net profits to distributors are diminishing. For 1949 they approximated 1.76 per cent after taxes. This was the lowest in ten years and about 45 per cent below 1948. While sales performance is outstanding, operating costs are disappointing. Distributors' overhead costs have hit the highest point in years. This is attributed largely to increasing payrolls, which now account for 74 per cent of distributors' operating expense dollar.

FRANZ T. STONE
. . . new head of manufacturers

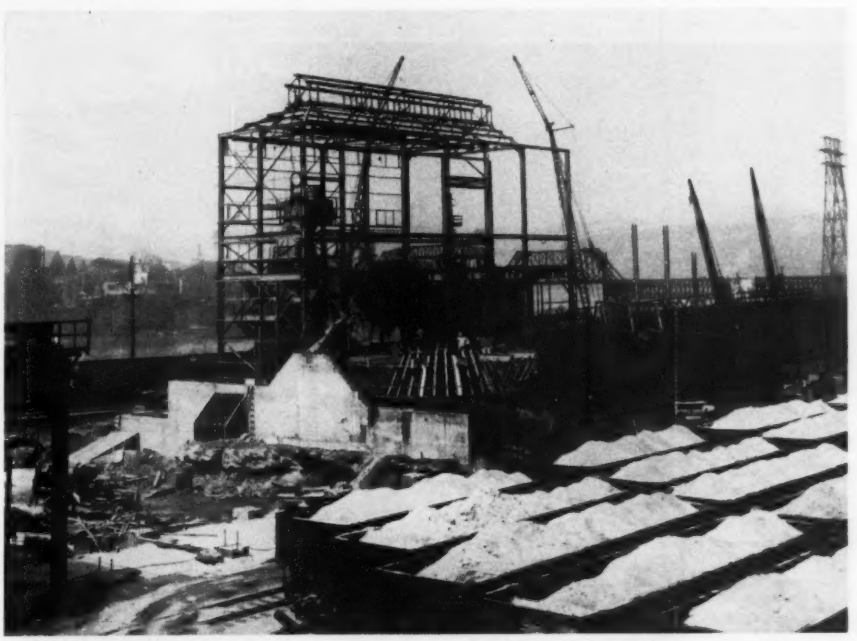
Stone Heads Manufacturers — Franz T. Stone, president, Columbus McKinnon Chain Corp., Tonawanda, N. Y. is new president of the American Supply & Machinery Manufacturers Association. Mr. Stone succeeds K. R. Beardslee, president, Carboloy Co. Inc., Detroit.

Other officers are: R. M. Johnson, Norton Co., Worcester, Mass., first vice president; J. A. Proven, Porter-Cable Machine Co., New York, second vice president; C. F. Connor, B. F. Goodrich Co., Akron, treasurer.

New executive committee members: Dan C. Swander, Columbian Vise & Mfg. Co., Cleveland; T. D. VanderVoort, Clemson Bros. Inc., Middletown, N. Y.; William J. Greene, L. S. Starrett Co., Athol, Mass.; J. Robert Kelley, Manning, Maxwell & Moore Inc., New York; L. B. Stoner, Jacobs Mfg. Co., Hartford, Conn., and Robert Wier, Jr., Osborn Mfg. Co., Cleveland.

Supply Groups Elect—J. H. Ruddell, president, Central Rubber & Supply Co., Indianapolis, is new president of the National Supply & Machinery Distributors Association.

Joe W. Pitts, president, Brown-Roberts Hardware & Supply Co. Ltd., Alexandria, Va., becomes president of the Southern Supply & Machinery Distributors Association.



BENEFITING FROM FLUE: The steel framework for another new U.S. Steel sinter plant changes the Monongahela river skyline at Rankin, Pa. This improvement at Carrie Furnaces of Carnegie-Illinois Steel is one of three new plants in the Pittsburgh district for the recovery of iron from blast furnace flue dust. One at National Tube Co.'s McKeesport plant is now operating. The sinter plants will add over a million net tons each year to the iron ore available for U.S. Steel blast furnaces

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Airframe runs mighty high these days; so Defense wants to do something about getting the price down in case there's another emergency

BECAUSE it's worried about the rise in manufacturing costs since World War II, the Defense Department is studying how prices on military items can be held down—if there's an emergency.

Defense officials think full co-operation of armed services and military contractors is necessary for achieving the goal; so they set about getting the co-operation. The Munitions Board asked its Industry Advisory Committee on Military-Contractor Relationship to study the matter and map out an approach.

The group is composed of outstanding industrial executives; it is chairmanned by Frederick C. Crawford, president of Thompson Products Co., Cleveland. They were told that military procurement officers look at the whole subject like this:

The possibility for applying a close forward pricing policy depends on the ability of the contractors to produce efficiently and upon their willingness to agree to do the work at lowest possible prices consistent with a reasonable profit. The committee was asked to suggest types of procedure for obtaining efficient production and for obtaining industry's acceptance of a close pricing policy.

Pound of B-36, Please — What caused the stir among the military? Here's an example: During the war when production was heavy the government paid an average of $19 a pound for airframes. Today, under limited production, it is paying an average of $57 per pound.

Government chairman of the Industry Advisory Committee on Military-Contractor Relationship is Cornelius Lynde; he also is an adviser on contract relations to the chairman of the Munitions Board and the chairman of the Joint Committee on Military-Contractor Relationship.

Is It a Plane? Is It—? No, It's . .

To the obvious delight of the senators gathered there, the demonstration took place in the Senate caucus room. The electric car whirled around in a 30-foot circle at high speed. It had grooved wheels at top and bottom, the bottom wheels resting on a rail at ground level, the top wheels engaging an overhead rail. What was it? A railplane—a proposition put before the Senate Committee on Interstate & Foreign Commerce to interest Congress in financing a new transportation system.

Railplanes are intended to enable the railroads to cut rates on passenger travel and permit the shuttling of passengers at a 150-mph clip. John A. Hastings, state senator from Great Neck, N. Y., read a lengthy statement describing the proposed method and its advantages. He showed a model of the equipment which, he said, is to be installed on Long Island.

Mr. Hastings' proposal was that Congress provide $500 million to finance a "Postalized Railroad Guaranty Corp." that would help railroads convert to railplanes, thus permitting railroads to sell passenger transportation at about a cent a mile.

Hovde, New BRAB Chairman

New chairman of the National Research Council's Building Research Advisory Board is Dr. Frederick L. Hovde, president, Purdue University.

He succeeds Dr. Frank B. Jewett, who died last November. BRAB—as the board is known—represents a co-operative effort by interested industries to advance the art of building construction through research.

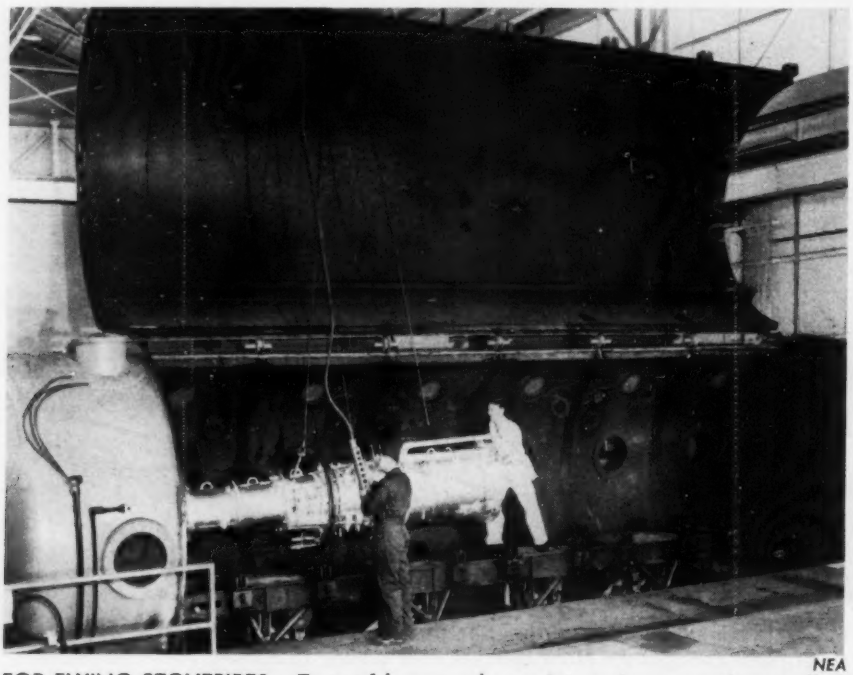
What's Small Business' Share?

How much does small business participate in military procurement through subcontracts placed by prime contractors?

The Munitions Board expects to find the answer to that by questionnairing a large number of companies. The board is acting on the recommendation by Ralph R. West, West Steel Casting Co., Cleveland.

The approval by the Bureau of the Budget is needed to carry on the study on the desired large scale.

Mr. West made his recommendation on behalf of a subcommittee of the Munitions Board Industry Advisory Committee on Military-Contractor Relationship. The committee



NEA

FOR FLYING STOVEPIPES: Tests of large-scale ramjet engines sometimes called flying stovepipes—at simulated altitudes of 100,000 feet and at four times the speed of sound are being carried on in a test chamber at the Ordnance Aerophysics Laboratory, Daingerfield, Tex. Here a ramjet is being lowered for a test run. Ramjets are used for propelling supersonic guided missiles

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had been asked to look into the matter.

MB Redirects Industry Problems

By a reorganization in the Munitions Board, all offices concerned with problems connected with industry are now grouped under a newly appointed "Director of Production Management."

Maj. Gen. A. B. Quinton Jr., USA, is now the acting director. (The director ultimately is to be a civilian with wide industrial experience; when that happens the present acting director will become military adviser to the director to provide a balance between civilian and military experience in the board's industrial programs.) The Director of Production Management will have full authority over the Offices of Production Planning, Materials Resources, Construction and Manpower and over the Aircraft, Petroleum, and Electronics Divisions.

Through another change, Rear Adm. Morton L. Ring, USN, becomes Director of Supply Management, and will have charge of the Offices of Procurement Methods and of Distribution Methods, and of the Standards, Materials Inspection, and Cataloging Agencies.

Senate May Up Highway Money

Federal aid for highway construction cleared its first hurdle when the House authorized $570 million for each of the two fiscal years ending June 30, 1952, and June 30, 1953.

This compares with: $550 million in the original House bill, $500 million in the President's budget request, $810 million asked by the American Association of State Highway Officials, $1 billion recommended by the American Road Builders' Association, and $450 million in the fiscal year 1950 and a like amount for 1951. Money to carry out the authorization still is to be appropriated. Whatever amount is finally voted to highway aid it probably will be upped in the Senate, with the difference resolved in conference, since the Senate is working on a bill calling for $828 million a year.

The House bill authorizes expenditure in each of the two years of $225 million for projects on the primary highway system, $150 million for secondary highways, $125 million for urban areas and $70 million for a national system of interstate highways. The House authorization, if sustained through the appropriation stage, would mean direct expenditures for highway construction in each of the two years of $1.14 billion in view of matching funds from the states.

A refinement now under consideration by the Senate Public Works Committee is a proposal that the parts of superhighways through cities be financed by bond sales and that the bonds be paid off in part from federal-aid highway funds.

How Much Damage to Highways

How much and what types of damage are wrought on American highways by heavy trucks will be determined over the next few months by a study to be conducted co-operatively by the National Highway Research Board, the Bureau of Public Roads, and at least nine states.

Maryland officials, who initiated the undertaking, set aside a test section of concrete highway south of Bel Alton. It will have four test lanes for determining road wear from different types of trucks and truck loadings. Lessons learned will be used for drafting future legislation covering use of the highways by trucks.

Reform in Customs Practice?

Sometime in June, after it has completed work on the tax revision bill, the Ways and Means Committee expects to work on a measure to reform U. S. customs practices.

Prepared by administration officials, it results from a study that was financed by an appropriation by Congress in 1947. The object: To get rid of uncertainties, abuses and complicated procedures against which importers for many years have complained. It simplifies the hitherto confused approach on setting valuations for tariff purposes, removes the presumption of fraud — except cases where it proves to have been deliberate —in cases of undervaluation, and removes many minor causes of delay and irritation. The bill is identified as H. R. 8304.

Minerals Book To Be Out Earlier

Printing schedules on the Department of Mines Minerals Yearbook were advanced by the Government Printing Office. Minerals Yearbook, 1948, now is expected to be available for sale by the middle of 1950, and Minerals Yearbook, 1949, by the end of the year.

Magnetic-Fluid Clutch Shown

Magnetic-fluid clutches, predicts Harold D. Anslow Sr. of the Navy's Bureau of Ships, will be widely used in industry and in the armed services. They are already being used effectively in machine tool applications.

Magneclutches or Magnebrakes—as the new products are termed — are available for five classes of service: Slip, reversing, on-off or torque, torque-limit and to replace friction brakes.

Representatives of Vickers Electric Division, Vickers Inc., St. Louis, are distributing an abstract of a new bulletin that the company will make available about the middle of next month on the magnetic-fluid clutch. Vickers built one of them for the connecting unit in a motor-generator set built under a special contract for the Fire Control Division of the Bureau of Ships. Mr. Anslow, electrical engineer for the bureau, thinks the unit is "very satisfactory."

The first practical use of the clutch, designed for rigid speed control requirements, (it was invented by Jacob Rabinow of the National Bureau of Standards in 1948) was exhibited in Washington a short time ago for the Navy Department.

Hostility Growing to Tariff Cuts

Increasing congressional hostility to further lowering of tariffs on many imported products, when new trade agreements are made with a large number of foreign powers at Torquay, England, this fall, may result in broadening an investigation to be conducted by the Senate Labor Committee.

The investigation was ordered when Senator Matthew M. Neely (Dem., W. Va.) asked for an investigation to show how unemployment has been caused in the coal, oil and railroad industries by "floods" of foreign oil. On requests of other senators the resulting resolution called also for an investigation of causes of unemployment in the silver, zinc and lead industries. After Republican senators had cited other industries that are suffering from present tariff rates, Senator Neely agreed to "help provide relief" if the need is shown.

President's Safety Meeting

The President's Second Conference on Industrial Safety will be held in the Interdepartmental Auditorium in Washington, June 5-7. Its main feature will be a series of presentations telling what happened at governors' conferences on industrial safety held in the past month or two in Illinois, Rhode Island, Kansas and California.

Cartels Welcome French Union Plan

Trust interests are happy about the scheme which jibes with philosophy of controlled markets. Despite their approval, proposal had political, not industrial, origins

EUROPEAN cartel interests on both sides of the Rhine are happy about the plan for a common economic policy of French and German heavy industry because it jibes with some of their philosophy of controlled markets and planned production.

Although cartel officials will back the plan, they were not consulted when the program was drawn up in its broad outlines. Origins of the French proposal are purely political. At the start, French and German steel companies were completely in the dark as to details of the scheme. The scant comment thus far on the matter from either French or German steelmakers stems more from surprise at developments than from disapproval.

Higher Prices?—Most French steelmen should like the program because it would solve a troubling competitive problem. Their steelmaking costs are generally above those in the Ruhr. Leveling of prices—probably upward—under the program would be a godsend to them. Ruhr steel people wouldn't mind the higher prices—and higher profits. If all the steel is to be allocated, the present use of low prices as a sales argument would no longer be necessary.

Cartels are riding again everywhere in Europe. The forthcoming survey by the Economic Commission for Europe, a group affiliated with the United Nations to spur recovery, stresses that situation. Free enterprise advocates in Europe fear that the French proposal will aid and abet the trend.

Revival — Former officials of the prewar steel cartel for all Europe are working to re-establish the trust by consolidating the little cartels that are already flourishing in some areas. They are well aware of the hostile American attitude and are moving gingerly. For the time being, they strive for agreements affecting European markets in which the U. S. is not greatly interested: In Scandinavia, the Netherlands, Switzerland, Spain, Portugal and possibly some Mediterranean countries such as Egypt.

The French Want More Support

French industrialists would hesitate to join up with the Germans if just the two were in the pact because the Ruhr heavy industrial production potential is greater than the French. They want at least the Benelux production in, and the British too, if they can get it, to balance the dreaded German capacity.

Steel, coal and power scarcities are nearly a thing of the past in France. By next winter it will no longer be necessary to ration electricity. By then, 110 million kwhr will be available daily, compared with 100 million now and 80 million in 1948-1949.

Industrial production in May is climbing back to the record rates it had reached just before the February and March strikes. The present level of domestic purchasing power and export prices will for some months to come forestall an increase in output beyond the May performance.

Oil-short France welcomes the discovery of what promises to be a modest oil strike in the Pau region. The 1949 crude oil production in France was only 58,000 tons. Natural gas production amounted to 23 million cubic meters last year.

Ruhr Steelmen Look for Angles

The German steel industry association approves the French plan, although at a Dusseldorf meeting some members openly charged the French with ulterior, competitive motives in taking the initiative.

Konrad Adenauer offers enthusiastic support of the French union plan. He may see in the scheme the way to end dismantlings, boost the steel ceiling and get other economic controls eased.

The Ruhr's ingot steel production amounted to 987,570 net tons in April, compared with 1,115,485 in March. Stainless steel business is especially good; order backlogs are mounting.

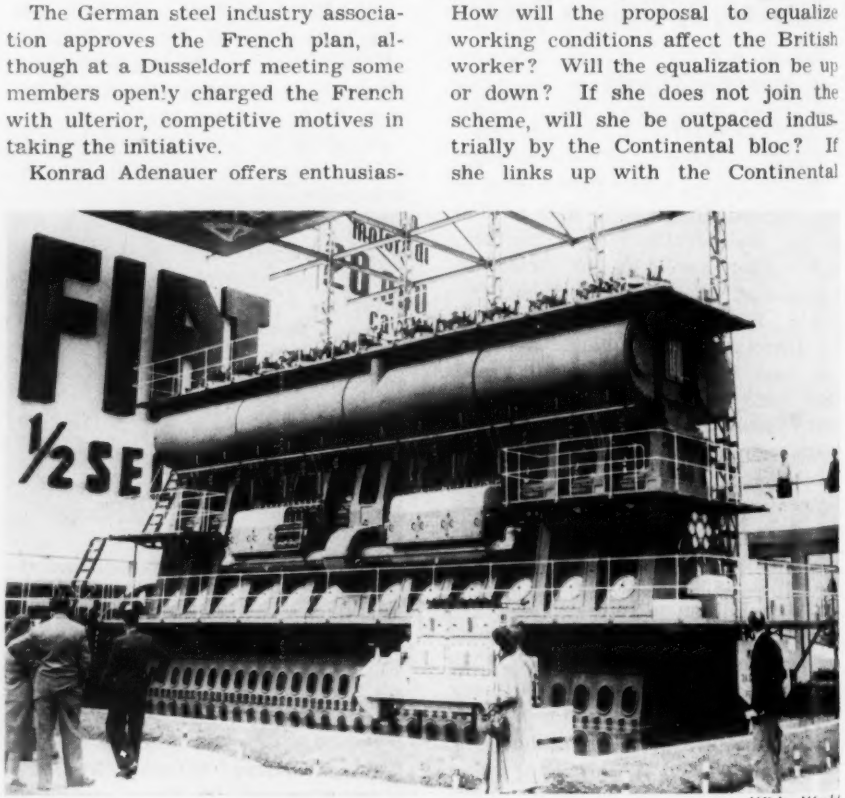
Unemployment is still too high, and government moves to remedy the situation are slow. Red tape stifles public construction. The government plans a public housing development of 250,000 dwellings, but not one has yet been started. Red tape will probably keep this program from starting until next August.

The German Shareholders Protective Association, established to protect stockholder interest in steel, coal and I. G. Farben plants, is campaigning for the Allies to leave the former companies as they are. The group may win out by default. The long awaited plans to reorganize the steel and coal industries are still not ready.

The British Have Qualms

The British have many qualms about the French plan. Here are a few of them:

How will it affect the British competitive position in world markets? How will the proposal to equalize working conditions affect the British worker? Will the equalization be up or down? If she does not join the scheme, will she be outpaced industrially by the Continental bloc? If she links up with the Continental



Wide World

480 TONS WORTH: This 20,000-hp Fiat marine engine, which was shown at the Milan Trade Fair, was designed for a new Italian ship that will ply between Italy and South America. The liner was built at the Montfalcone shipyards near Trieste

bloc, how much industrial independence will she be able to keep?

In the world markets, Britain is fighting a price war. Steelmaking costs just went up an average of $1.40 per ton because of rail freight rate hikes, but the industry is absorbing the increase. Steel prices are expected to stay about the same for the rest of the year. One reason why steelmakers can hold the line is that productivity is improving. It's now 17 per cent over the prewar peak.

Steel Co. of Wales Ltd. hopes to capture more of the world's tin plate market when a new $30 million mill begins production next year, probably in April. Steel of Wales is building a five-stand mill at Llanelly, to be the largest in Europe.

Steel producers generally have orders to ensure full capacity operations for the next six months. Rollers of steel plates, heavy sections and rails are operating at capacity, largely because of a good export market. The automobile makers are taking every pound of steel they can get. They produced 198,000 cars and trucks in the first quarter; 134,600 of these were exported, 53,000 more than in the first quarter last year. March overseas shipments included 6300 cars to Canada, a new record, and over 1000 cars to the U. S.

The British Iron & Steel Research Association is planning a new research station in Sheffield which will have the equipment of a steelworks in miniature, so that research work can be tested before full-scale application. Equipment will include an electric furnace with a capacity of 1000 pounds, a small cold strip rolling mill and an experimental wire drawing plant.

Export Backbone: Metals, Metal Products

Although the dollar volume of all exports declined in 1949, 1949 exports' proportion of metals and their manufactures was about the same as it was in 1948

EVER WONDER how important metals and metal manufactures are in exports from the United States?

Here's your answer: Metals and their manufactures constitute 39 per cent of the dollar value of exports from this country.

In 1949 when the value of all United States exports was $11,885,195,605, metals and their manufactures accounted for $4,640,294,044 of it, reports the Foreign Trade Division of the U. S. Bureau of the Census. No other commodity group was even half as large dollarwise as the sum of metals and their manufactures. Thus, it might be said metals and their manufactures are the backbone of U. S. exports.

The 1949 exports' proportion of metals and their manufactures was about the same as that in 1948. But dollar volume of total exports and exports of metals and their manufactures declined slightly in 1949, from 1948 levels. Total exports in 1948 were valued at $12,493,999,584. That figure included $4,802,636,577 in metals and their manufactures.

The 1949 value of $4,640,294,044 placed on metals and their manufactures consisted of $3,516,848,461 in machinery and vehicles and $1,123,445,583 in metals and manufactures other than machinery and vehicles.

Comprising the $3,516,848,461 in machinery and vehicles, designated as Commodity Group 7, are: Electrical machinery and apparatus, $470,207,889; engines, turbines and parts, $196,632,474; construction, excavating and conveying machinery, $221,061,667; mining, well and pumping machinery, $187,804,499; metalworking machinery, $196,501,855; textile, sewing and shoe machinery, $156,242,479; other industrial machinery, $361,650,891; office appliances, $84,026,325; printing and bookbinding machinery, $44,865,544; agricultural machinery and implements, $128,404,959; tractors, parts and accessories, $293,327,629; automobiles, parts, accessories and service equipment, $750,492,835; aircraft, parts and accessories, $112,821,366; other vehicles and parts, $229,004,490; and special category, $83,803,559.

The 1949 value of $1,123,445,583 in metals and manufactures other than machinery and vehicles, and designated as Commodity Group 6, was made up of: Iron ore and concentrates, $14,653,817; steel mill products, $732,136,095; iron and steel manufactures, $183,381,951; ferroalloys, $5,040,362; aluminum and manufactures, $33,437,432; copper and manufactures, $75,770,185; brass and bronze manufactures, $20,563,547; lead and manufactures, $3,159,233; nickel and manufactures, $4,767,817; tin and manufactures, $2,422,012; zinc and manufactures, $24,412,934; other nonferrous ores, metals and alloys except precious, $18,376,827; and precious metals and plated ware, except jewelry, precious metals for dentistry, gold and silver ore, bullion and coin, $5,323,371.

Not only did total exports from the U. S. decline in 1949 but imports did also. In 1949, U. S. imports for consumption, says the Foreign Trade Division, were valued at $6,598,058,377, compared with $7,092,031,829 in 1948. Decline in exports was 5 per cent and decline in imports for consumption was 7 per cent.

Tariff Hearings

If you want to get a word in about tariffs, remember June 5 for appearance notices

JUNE 5 is the last time that notices of appearances at the tariff hearings scheduled to begin June 19 will be received.

Notifications should be addressed to the body that will hold the hearings, the Committee for Reciprocity Information, United States Tariff Commission, Washington 25. Written briefs and statements will be received by the committee up to noon of June 12. The written briefs and the oral remarks to be given at the hearings will be considered by the government in negotiating new trade agreements at Torquay, England, beginning Sept. 28.

Also Included—The original list of products to be considered at Torquay has been enlarged: A supplementary list includes:

Clockwork mechanisms and all mechanisms or instruments for measuring time, distance, speed, or fares or flowage of water, gas, etc.; cut tacks and brads; tobacco, wrapping, packaging, sawing and woodworking and other machinery; certain hand tools like bit braces; blow torches and incandescent lamps operated by compressed air and kerosene or gasoline; parts of carbonated-water siphons; "articles or wares not specially provided for, if composed wholly or in chief value of iron, steel, lead, copper, brass, nickel, pewter, zinc, aluminum, or other metal, but not plated with platinum, gold, or silver, or colored with gold lacquer, whether partly or wholly manufactured.

No Further Concessions—The number of countries that new agreements will be made with has been enlarged. But, "the United States will not consider granting further concessions at Torquay on items on which it already made concessions at Annecy (France)."

There may be negotiations about a few items of substantial interest to countries that the United States did not negotiate with at Annecy.

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This "new arithmetic in steel" is in step with industry's trend to the use of improved steels. When cold-rolled steel was found to be preferable to hot-rolled for many uses, industry substituted cold-rolled for hot in these uses. Today, it is equally logical and economical to replace simple carbon sheets with low-alloy high-tensile.

N-A-X HIGH-TENSILE makes it possible to reduce sections by 25% ... and *still provide* greater strength and durability than can be obtained with thicker sections of mild-carbon steel! Each ton of N-A-X HIGH-TENSILE steel represents a potential 33% increase in finished goods. Manufacturers are finding that N-A-X HIGH-TENSILE enables them to get 33% greater usefulness out of steel supplies.

Investigate this great opportunity to make each ton of sheet steel go farther ... through the superior quality of N-A-X HIGH-TENSILE.

GREAT LAKES STEEL

Corporation

N-A-X Alloy Division, Ecorse, Detroit 29, Mich.
UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Buick turns out 2200 engines a day, far beyond anything ever achieved before. Top limit near as some departments work around the clock, seven days a week

DETROIT

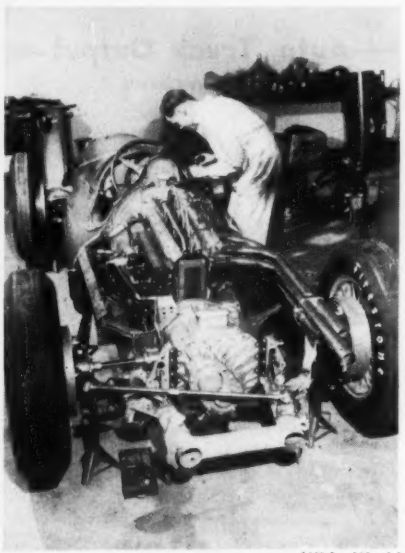
WHEN Slim Larke, Buick's assistant general manufacturing manager who has spent the last 40 years on the job in the division's motor machining and assembly plant, watches the furious pace of manufacturing operations there today he admits he can hardly believe his eyes.

The daily outpouring of engines averages close to 2200, far beyond anything ever achieved before. As Larke says, you never know what you can do until you get right down to the task and start rolling. The plant is bumping against its physical top limit now, with some departments working around the clock seven days a week to keep enough float ahead of the hungry final assembly line and test floor.

The Machinery Helps—Within the last few months an entirely new automatic transfer machine line has been installed to process blocks for the Buick Super engine, one of the three power plants built. Equipment is the latest of its type and stretches for over 900 feet in all, extending across the width of the plant three times. On a recent press tour, visitors were shown the first seven machining stations, equipped with Ingersoll, W. F. & John Barnes, and Greenlee machines for the initial operations.

Station 1 is a 94-foot unit which takes rough block castings at the starting end and performs these operations: Milling of locating pads, rough milling the panrail, rough milling the cap clearance and cap seat, rough and semifinishing the top face and also the panrail, milling and broaching cap seats, drilling, chamfering and reaming the locating holes, and rough and finish milling the valve cover side. The machine alone has 11 miles of wiring in it, and a total of 184 limit switches for shutting off tools after the proper amount of work has been done.

Lots of Holes — Station 2 is an eight-spindle boring mill which rough bores the eight cylinder holes. A workman slides the block from the first to second station along a conveyor and if mechanical or electrical trouble should develop at the second station the blocks can be pulled off the line without the necessity of shutting down the first station. This is also true on succeeding stations and is something Buick process men learned after experience with an earlier transfer line where it was required to shut down the entire line if trouble developed at any one station.



Wide World

ROUNDS ROCKET: That's what they call this rear-engine racer that is entered in the Memorial Day Speedway race in Indianapolis tomorrow. The racer, conditioned by Tool Design & Engineering Co., Culver City, Calif., is powered by a Meyer-Drake 270-cu in. engine. The rear axle is the De Dion type, independent from the drive housing. The car weighs 2215 pounds and is expected to develop 325 hp

Station 3 is a six-station milling machine which rough and finish mills the front end, mills the end rear bearing and rough and finish mills the rear end of the block.

Station 4 is a 13-station drill for drilling the oil gallery holes, 61 of them in all. The holes are 34 inches long and are drilled in steps of 3½ inches each, with drills working simultaneously from opposite sides. At the operation a single drill goes all the way through to connect the opposite holes.

Rough Bores—Station 5 is a milling and boring machine which mills all pads on the side, the water pump, fuel pump and motor mounting pads, rough bores the main bearings and cams and faces four cleanout plugs.

Station 6 is a six-position drilling machine which drills 62 holes, one of them being only $\frac{1}{16}$-inch diameter into ⅛-inch of stock.

Station 7 is a ten-position automatic unit which drills, chamfers, mills, core drills and reams various holes, doing one operation or another on 89 different holes in the block.

Savings in Money and Men—The entire new transfer unit cost approximately $1,750,000 and has resulted in the saving of $1.57 on machining of each block, as well as dispensing with 125 men on full-time operation.

Despite the economies possible with new types of automatic machining equipment, and the increased precision which it brings, the days of the Buick engine plant are numbered, for work is already under way in the planning of an entirely new motor building to handle the processing and assembly of a new engine design, presumably of the V-8 high-compression type. It will likely be three years, however, before the plant is functioning. Meanwhile operations in the present location will continue uninterrupted, permitting the new building to be started from scratch and to be equipped with still more advanced types of machining and handling devices. About 4000 now are at work in the engine division.

Shiftless Wonder—Somewhat more of a show place, as it should be considering it is only a little over four years old, is Buick's automatic transmission division which recently celebrated production of the 500,000th Dynaflow transmission, a remarkable production record in view of the fact the design was something brand new and of complicated construction. In the first month of operation in 1946, a total of 146 transmissions was built, each reportedly costing more than a Roadmaster sedan. Now the output rate has climbed to 1850 a day, five days a week, and a "reasonable" profit is being realized on the present price of $169 to the customer.

There has been a steady refinement of the Dynaflow design in the interest of smoother operation and lowering cost. For one thing, the former "jerk" experienced in shifting to the reverse position has been eliminated by a change in valving. Numerous other changes have been effected in the interests of economy—for ex-

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ample, a shift from SAE 5140 steel, heat treated, for the main spline shaft in the planetary gear unit to SAE 1035 hardened by the electric induction process. Buick officials foresee the day, perhaps inside of five years, when automatic transmissions will become standard equipment on passenger cars. Already 80 per cent of all buyers are specifying the device and paying the premium it involves. Production plans call for boosting this so that 85 per cent of all Buicks will have the device.

Packard Pushes Ultramatic

Packard took newsmen through its new transmission division last week and displayed some novel types of machining and assembling equipment installed there at a cost of better than $7 million.

Assemblies of the Ultramatic now have passed 30,000 and better than 10 per cent of the company's employees are working two shifts in this department. A conveyor system more than half a mile long feeds into an oval-shaped final assembly line which turns out 40 complete units per hour. The final line is fed by eight major subassembly lines which in turn are stocked by numerous sub-sub lines. Approximately 30 minutes are required for one complete transmission assembly from the time the unit starts around the final conveyor. One operator handles the entire job on one transmission, differing from the usual practice of passing an assembly from one station to another, with different crews at different stations.

Col. J. G. Vincent, Packard's executive vice president, says other companies have sought to buy the Ultramatic for their own use, but it has been decided to keep it a Packard exclusive in contrast to the General Motors' policy of selling its Hydra-Matic transmission to other manufacturers—including, thus far, Lincoln, Nash and Kaiser-Frazer. Hudson is rumored to be a likely further addition. One reason for the latter policy may be that GM in the near future is slated to introduce a new type of automatic transmission combining features of the Hydra-Matic and Dynaflow designs to the extent of locking out the torque converter element at cruising speeds. This unit probably would be featured by Cadillac and Oldsmobile at first, since Buick engineers have said they see no early possibility of going to a "locked-out" type of design.

Long Weekend Cuts Output

A respite from the driving production tempo of the last several months was due this past week-end as Packard, General Motors and probably others scheduled a long holiday, from Friday until Wednesday of this week. This would mean a loss of two days' production, plus whatever Saturday work might otherwise have been on tap. GM divisions lost about 9500 units as the result of the rail strike but hoped to make up the deficiency without trouble.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	610,211	445,092
February	504,954	443,734
March	609,463	543,711
April	582,000*	569,728
May		508,101
June		523,689
July		604,351
August		678,092
September		657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
May 6	146,337	130,113
May 13	174,480	118,199
May 20	172,585	116,878
May 27	178,000	117,703

Estimates by Ward's Automotive Reports

* Preliminary.

The Public Likes Hard-Tops

As mentioned here in past weeks, demand for hard-top convertibles continues to outstrip the fondest hopes of all producers of this body style.

Chrysler now has introduced the design in Dodge, DeSoto and Chrysler models and assemblies are held down only by the limit of production facilities. Buick sales officials report they could sell 45 per cent of their entire output in hard-tops and a trip through the plant confirms this, with seemingly nine out of every ten cars in the driveaway lots sporting this styling. The bonanza struck by hard-top convertibles will be reflected in the body styling of all 1951 lines, according to the way Detroit sees it now. They represent something entirely new and most of them carry attractive prices below the conventional convertible models, and the public is going for them in a big way.

Ford Opens Teletype Center

Ford has just opened what is claimed to be the largest single automatic teletype relay center in the world at its Dearborn offices. Equipment is capable of automatically relaying and transmitting more than 12 million words a month over 18 duplex and 31 simplex privately leased circuits. The duplex circuit can send and receive simultaneously at a speed of 75 words a minute, while the simplex can do either, but not simultaneously at the same rate.

The network, which links 59 field offices directly with the Dearborn automatic relay center, eliminates the need of five major manual relays formerly operated at Dearborn, Chicago, Louisville, Edgewater, N. J., and Kansas City, Mo. Each originating point on the network has a two-letter code designation. The relay unit automatically interprets these station directing codes, directs messages to the proper offices, temporarily stores messages when necessary and intercepts messages with incorrect directing codes. Special relay equipment provides for sending the same message to a number of stations. Circuits were established on the basis of the average volume of messages from each of the company's operating locations.

Continental Shipments Up

Engine shipments by Continental Motors Corp. and subsidiaries in the quarter ended Apr. 30 were more than double those of the preceding three months and 23 per cent ahead of the like period of 1949, totaling 110,220.

This has been really good news for company employees, particularly in Muskegon, Mich. That city has been judged a critical industrial area in need of additional business.

GM May Spend $250 Million

In his address to stockholders at Wilmington, Del., Alfred P. Sloan Jr., chairman of the board of General Motors, notes the corporation currently has authorized expenditure of over $100 million for tools, dies, jigs, and fixtures incident to 1951 model production, will spend about $50 million in the next two years to complete a new technical center now under construction, and may find it necessary to spend $100 million more in plants and facilities to make automatic transmissions more fully available.

On the subject of the small passenger car, he says the corporation cannot seem to justify it either in an economic sense or commercially, when considered in relation to existing types as applied to domestic consumption. However, he added that conditions change—"Today is today, tomorrow is tomorrow."

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RADIAL LOADS & THRUST
From Any Direction

Taken by ONE
Single Row Ball Bearing
(either sealed-for-life or plain)

One easily applied, unit bearing, requiring no adjustment, provides ideal radial support and axial location in both directions for an infinite variety of shaft mountings. If a ball bearing is used at the other end of the shaft, it floats — takes radial load only. Or the other bearing may be a plain bushing, or any radial, anti-friction type the designer may elect. No headaches over shaft expansion or normal machining errors.

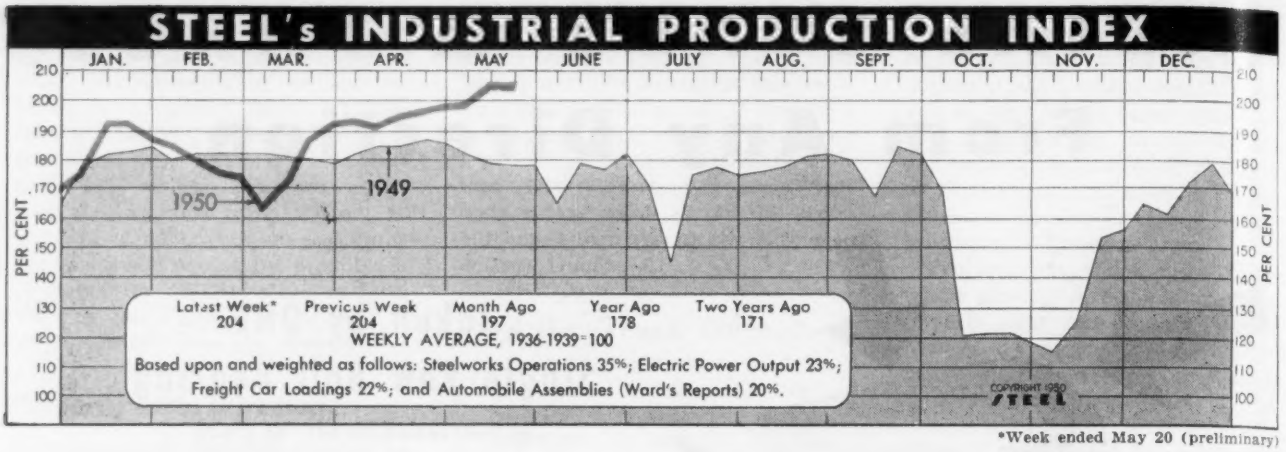
Check into this for greatest simplicity and economy in your designs. The famous New Departure rear wheel bearing* on leading cars is an example. . . . Remember — no other bearing not of dual type or not used in opposed pairs can equal this load service.

*Send for booklet RW showing this application.

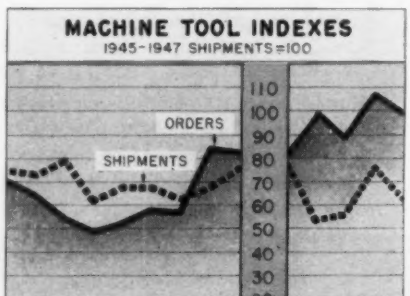
Nothing Rolls Like a Ball

NEW DEPARTURE BALL BEARINGS

NEW DEPARTURE • Division of GENERAL MOTORS CORPORATION • BRISTOL, CONNECTICUT BRANCHES IN ALL PRINCIPAL CITIES


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1950
1949
Latest Week* 204
Previous Week 204
Month Ago 197
Year Ago 178
Two Years Ago 171
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1950 STEEL

*Week ended May 20 (preliminary)

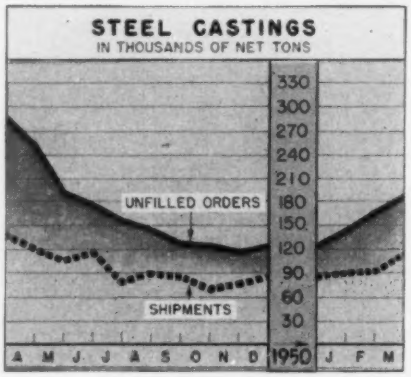


Charts—Copyright 1950, STEEL

Machine Tool Indexes

	New Orders		Shipments	
	1950	1949	1950	1949
Jan.	99.7	87.0	52.4	68.8
Feb.	89.2	80.9	56.1	70.3
Mar.	107.4	93.5	75.3	75.8
Apr.	99.2	70.1	61.7	74.7
May	...	63.7	...	72.8
June	...	53.6	...	79.0
July	...	48.0	...	60.7
Aug.	...	51.5	...	67.3
Sept.	...	57.7	...	67.6
Oct.	...	56.8	...	62.3
Nov.	...	84.3	...	67.6
Dec.	...	82.5	...	75.7

National Machine Tool Builders' Assoc.

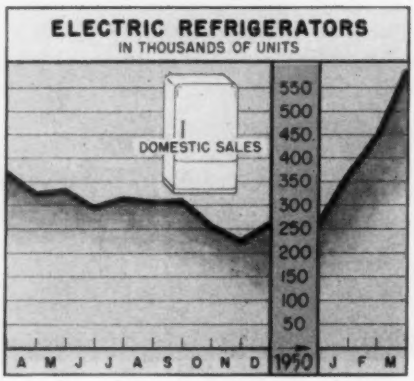


Steel Castings

In Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1950	1949	1950	1949
Jan.	88.8	140.6	142.5	338.9
Feb.	91.8	135.0	165.2	320.2
Mar.	111.8	138.9	185.6	284.8
Apr.	....	120.0	....	250.5
May	....	106.2	....	191.5
June	....	116.1	....	173.2
July	....	78.7	....	155.5
Aug.	....	90.0	....	143.6
Sept.	....	86.5	....	127.7
Oct.	....	70.7	....	124.8
Nov.	....	76.4	....	117.9
Dec.	....	84.5	....	122.9

*For sale. Bureau of the Census



Electric Refrigerators

Domestic Sales—Units

	1950	1949	1948
Jan.	364,002	380,853	272,121
Feb.	450,751	337,424	281,580
Mar.	586,293	369,216	338,109
Apr.	.....	324,370	330,720
May	.....	330,753	317,763
June	.....	296,199	373,115
July	.....	315,444	351,094
Aug.	.....	307,622	281,345
Sept.	.....	309,429	344,260
Oct.	.....	252,580	380,854
Nov.	.....	221,221	374,470
Dec.	.....	259,158	330,660

National Electrical Mfrs. Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Constr. Valuation ..May22	Gray Iron Cast.....Apr.24	Pumps, Orders May1
Durable Goods Apr.24	Ind. Fur. Orders...May15	Purchasing Power ..May8
Fab. Struc. Steel...May8	Indus. Prod. May8	Radio, TV Output..May15
Forgings, Steel Apr.3	Ironer Sales May15	Steel Employment..May22
Fdy. Equip. Orders.May15	Mall. Iron Cast ...May22	Steel Shipments ...May22
Frght. Car Backlog.May15	Metalwork. Wages..May22	Trucks, Elec. Ind...Jan.2
Furnaces, W. Air...May8	Metalwork. Employ..May22	Vacuum Cleaners...May1
Gear Sales May8	Price Indexes May1	Washer Output May15

Tool Orders Slip, but Not Far

New orders for machine tools in April declined from the high level of the previous months but were considerably above April, 1949, according to a preliminary report from National Machine Tool Builders Association.

Foreign orders included in the newly booked business registered declines from both the previous month and the corresponding month a year ago. Index on foreign orders in April was 17.6, compared with 24.9 in March and 23.1 in April, 1949.

In the base years (1945-1947) on which the indexes are based, average annual shipments for that period are estimated at $344 million.

Castings Activity Rises

Shipments of steel castings have been rising steadily since last October. Unfilled castings orders have been climbing since last November. Because manufacturers of finished products must order their casting components considerably in advance, casting activity is a good barometer of future business weather.

While neither shipments nor unfilled orders match the rate of early 1949, the trend is upward. Shipments of steel castings in the first 1950 quarter totaled 292,400 tons, compared with 414,500 tons for the same period last year.

Record in Refrigerator Sales

Domestic sales of electric refrigerators hit an alltime high of 586,293 units in March.

First quarter sales jumped to another record, 1,401,046 units. That compares with 1,087,493 in the first 1949 quarter and 891,810 in the first 1948 period. If the first quarter rate continues, sales for 1950 will exceed 5.5 million units. The actual sales record was set in 1948 when 3,976,091 were sold.

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The Business Trend

The record industrial production pace continues. STEEL'S index holds at the alltime high of 204 as sensational steel and automaking rates buttress the boom

THE NATION'S record industrial pace continues, buttressed by sensationally high auto and steelmaking rates.

STEEL's industrial production index for the week ended May 20 held at 204 per cent (preliminary) of the 1936-1939 average, the new high that was set in the May 13 week. That record was maintained despite the firemen's strike on four railroads which ended May 16.

Steelmaking operations continue in the stratosphere at over 101 per cent of theoretical capacity.

Production of cars and trucks in the U. S. and Canada dipped slightly in the week ended May 20 to 172,585, down 1895 from the preceding week's alltime record of 174,480, according to *Ward's Automotive Reports*. The slight decline was not enough to affect STEEL's production index.

The drop in U. S. car production from the previous week is accounted for by a decline in Chevrolet output because of the rail strike. Ford's ability to maintain production enabled it to pass Chevrolet for the week with assemblies of 25,800 cars, compared with about 22,000 for Chevrolet.

Total production of cars and trucks for the year to date by the U. S. and Canada is 2,814,191 units, compared with 2,381,255 for the like period last year.

Employment...

Increased output-per-worker is causing a rise in production without a corresponding increase in employment says the Federal Reserve Board. The number of unemployed who have been out of work for 15 weeks or more rose to 1.2 million in April, double the number a year earlier and "considerably higher" than in any postwar month. The board notes that graduating classes this year "will be exceptionally large" and that unemployment probably will rise again this summer. But FRB says that the outlook is still bright for a high level of economic activity for the next several months.

Coal...

The soft coal industry in 1950 will have one of its best years "under peacetime conditions," says Appalachian Coals Inc., coal marketing agency. The agency takes issue with "pessimistic plaints" predicting a coal market collapse.

It says that in the first 20 weeks of this year, through May 20, bituminous output totaled about 171 million tons and that if 10.3 million tons per week are produced for the rest of the year, the 1950 total will be about 500 million tons. Until the last few weeks, production had been running at more than 11 million tons weekly.

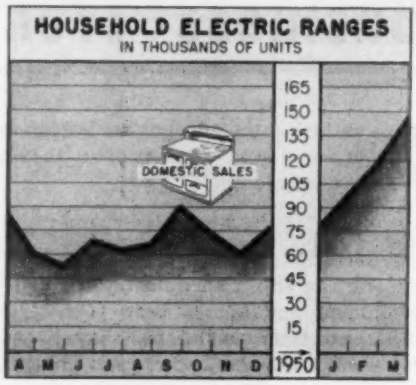
ACI says that the seasonal movement of coal to the Great Lakes has just started and that most industry users are still carrying low stocks of coal.

Many of the peacetime years that were considered fairly good did not achieve an output of 500 million tons, according to the agency.

"Not only is production scheduled

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.0	100.5	100.0	95.0
	Electric Power Distributed (million kilowatt hours)	5,845	5,864	5,846	5,255
	Bituminous Coal Production (daily av.—1000 tons)	1,685	1,797	1,888	2,206
	Petroleum Production (daily av.—1000 bbl.)	5,117	5,118	5,026	4,959
	Construction Volume (ENR—Unit $1,000,000)	$206.0	$183.3	$185.7	$157.8
	Automobile and Truck Output (Ward's—number units)	172,585	174,480	149,855	117,188
	*Dates on request. †1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	715†	717	723	774
	Business Failures (Dun & Bradstreet, number)	199	217	188	172
	Money in Circulation (in millions of dollars)‡	$26,980	$27,041	$26,992	$27,392
	Department Store Sales (changes from like wk. a yr. ago)‡	+8%	−10%	−19%	−3%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$13,825	$13,107	$15,082	$13,778
	Federal Gross Debt (billions)	$256.0	$255.8	$255.6	$251.7
	Bond Volume, NYSE (millions)	$21.7	$17.5	$18.7	$15.6
	Stocks Sales, NYSE (thousands of shares)	9,752	9,396	15,331	4,361
	Loans and Investments (billions)†	$66.4	$66.5	$66.6	$62.0
	United States Gov't. Obligations Held (millions)†	$35,899	$35,916	$35,941	$34,111
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.13	156.13	156.13	152.90
	STEEL's Nonferrous Metal Composite‡	172.7	169.5	162.3	183.0
	All Commodities†	155.9	155.1	152.2	155.5
	Metals and Metal Products†	170.3	170.1	170.0	168.6
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

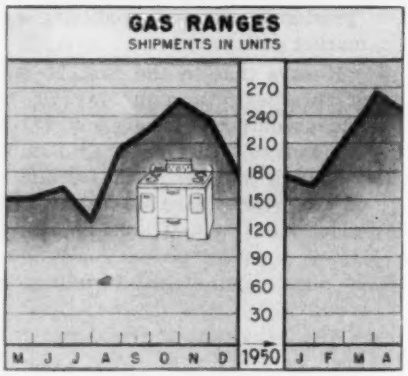


Household Electric Ranges

Domestic Sales—Units

	1950	1949	1948
Jan.	97,925	106,473	103,585
Feb.	118,989	87,370	103,506
Mar.	145,417	87,543	127,461
Apr.	.....	59,894	104,677
May	.....	52,286	98,983
June	.....	68,107	123,300
July	.....	62,402	83,485
Aug.	.....	66,222	116,107
Sept.	.....	91,073	128,829
Oct.	.....	72,672	122,516
Nov.	.....	60,523	123,661
Dec.	.....	77,011	105,387
Total	.....	903,806	1,341,497

National Electrical Mfrs. Assoc.

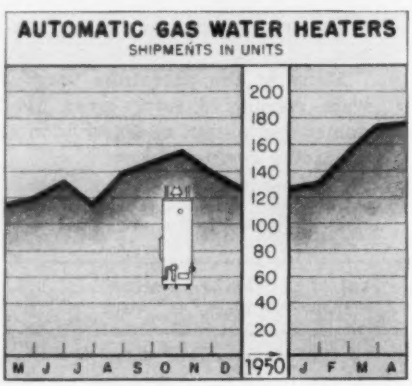


Gas Ranges

Shipments in Units

	1950	1949	1948
Jan.	165,000	106,700	222,800
Feb.	209,000	117,700	228,400
Mar.	*268,000	151,500	252,100
Apr.	*246,000	150,100	245,300
May	.....	151,600	257,800
June	.....	162,200	250,500
July	.....	125,800	203,600
Aug.	.....	206,100	250,100
Sept.	.....	227,300	248,500
Oct.	.....	257,500	257,500
Nov.	.....	237,400	202,300
Dec.	.....	175,700	131,100

Gas Appliance Mfrs. Assoc. * Preliminary



Automatic Gas Water Heaters

Shipments in Units

	1950	1949	1948
Jan.	131,600	88,400	126,600
Feb.	154,000	84,500	110,900
Mar.	*175,000	106,000	131,600
Apr.	*176,700	115,200	134,100
May	.....	120,200	118,600
June	.....	132,200	122,000
July	.....	114,400	121,300
Aug.	.....	138,800	160,200
Sept.	.....	147,300	149,300
Oct.	.....	154,200	127,500
Nov.	.....	138,300	109,000
Dec.	.....	126,500	88,900

Gas Appliance Mfrs. Assoc. * Preliminary

Charts—Copyright, 1950, STEEL

to continue at a high level," says ACI, "but profit possibilties remain good for the producer and seller of strictly clean and quality coals."

Military Spending . . .

Military spending in fiscal 1952 will be at least as large and probably greater than the $13,350 million which is scheduled for the next fiscal year.

That is predicted by government sources who say America's role under the new Atlantic Pact program will lead to a greatly strengthened Air Force and Navy. The Army is to continue at its present level and will get about $4 billion a year.

It is also estimated that direct U. S. arms aid to the European countries will run at about $1 billion-a-year level for the next few years.

Prices . . .

The upsurge in wholesale prices during the past few months is beginning to reach the consumer.

That's indicated in the government's consumer price index for April. The index shows average prices paid by middle-income families in big cities across the country rose 0.2 per cent from Mar. 15 to Apr. 15.

The figure for all prices in Mid-April was 167.3 per cent of the 1935-1939 average, compared with 167 per cent in mid-March. The April price level is 0.4 per cent below the same period in 1949.

The Labor Department's Bureau of Labor Statistics reports its index for all commodities hopped to 155.9 per cent of the 1926 average in the week ended May 16. That compared with 154.9 for the previous week.

Sales Potential Rises

Markets opening for makers of gas-using equipment as pipe line construction soars

IF YOU make industrial or domestic equipment using natural gas, prepare for new markets because natural gas may soon be available in every major city of the U. S.

What more gas means to equipment makers is indicated in high sales for two gas appliances—water heaters and ranges—charted at the left. The prediction about the increased availability of natural gas is made by Gas Appliance Manufacturers Association and is based on past and future pipe line construction and on reserves of the fuel in gas fields.

Step on the Gas — From July 1, 1945, to Jan. 1, 1950, 22,326 miles of major natural gas pipe lines were authorized by the Federal Power Commission. These lines would cost $1,421,337,000 and would require an estimated 5,337,900 tons of steel pipe ranging in size from 2-inch to 34-inch.

On Jan. 1, 1950, 10,803 miles of these authorizations, costing $606,850,000, were known to be completed and operating. They took 2,553,400 tons of steel pipe. As of the same date, notice of completion has not been filed for construction authorized from July 1, 1945, to Jan. 1, 1950, that would cost $814,487,000, would involve 11,523 miles and would take 2,784,500 tons of pipe.

Coming Up—The projects pending authorization of the FPC on Jan. 1, 1950, included another 12,700 miles of line that would cost $873,936,000 to build and would take 2,460,800 tons of pipe. The total of natural gas pipe line projects authorized during the past four and a half years and those pending authorization last Jan. 1, is 35,026 miles that would cost $3,295,273,000 to build; 7,798,700 tons of pipe would be used.

In 1949 alone, pipe line construction was authorized to bring new gas facilities or to augment the present supply to more than 100 cities of 50,000 or more population. Most of these cities were in the East, including Baltimore, Washington, Wilmington, Del., Philadelphia, Harrisburg, Pa. and Camden, Jersey City, Trenton and Bayonne, N. J.

Reserve Power—Is there enough gas to support increased consumption? Proved recoverable reserves of natural gas reached an alltime peak of 180.4 trillion cubic feet on Dec. 31, 1949, says the American Gas Association's Committee on Natural

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Gas Reserves. At the end of 1948, proved reserves totaled 174.9 trillion cubic feet. In 1919 reserves were estimated at only 16 trillion cubic feet. Technological advance has facilitated the discovery of additional reserves to the extent where, annually, the rate of discovery far exceeds the rate of consumption.

Boom Bloom To Fade by Winter

The present boom will slough off sometime next winter, predicts Roy C. Ingersoll, new president of Borg-Warner Corp.

He says the eventual production decline will take the form of an adjustment, rather than a sharp slump. Consumer demand will continue on a permanently higher level than before the war, he believes.

Borg-Warner's Norge Division is continuing to operate at capacity six days a week. The Detroit Gear Division, which this year started making automatic transmissions for Studebaker Corp., has reached a production of 250 a day and will double that rate soon. The Warner Gear Division at Muncie, Ind., which will manufacture automatic transmissions for Ford and Mercury, will get into production on this contract in June and will reach full scale output in late fall or early winter.

IBM Order Backlog Big

International Business Machines Corp.'s volume is excellent and the company is working on a big backlog of orders, says Chairman Thomas J. Watson.

Profits for the first quarter were the best for any like period in IBM's history. Mr. Watson is optimistic over prospects for the balance of the year.

Last year IBM put seven new products on the market, and they account in part for the improvement in sales. The company soon will announce another new product.

Caterpillar Is "Optimistic"

Caterpillar Tractor Co. is "optimistic" about business prospects because "of the vast amount of construction going on or being planned," says L. B. Neumiller, president.

"In addition to our earthmoving equipment, substantial volume has developed for pipe-laying machinery plants, pumping plants and other heavy equipment," he adds.

He says that the $55 million spent in expanding plant facilities since 1945 is beginning to pay off in lower operating costs and increased efficiency. The company has begun construction of a new plant on a 300-acre site in Joliet, Ill., to fabricate its own bulldozers and earthmoving equipment components.

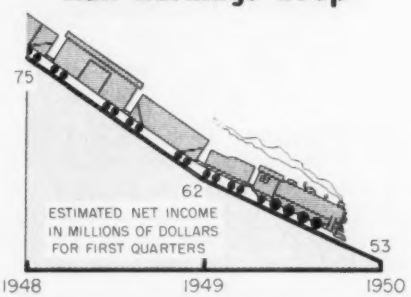
Railroads Out of Step

They still make a profit, but it's falling as industry produces, ships at a record rate

MOST industries are making hay while the economic sun shines—but not the railroads.

True, they still are operating at a profit, but it's declining now (see the income chart) at a time when the nation is producing and shipping at an unprecedented rate.

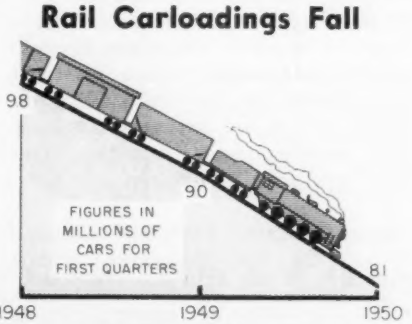
Rail Earnings Drop



Out of Step—Estimated net income after charges for Class I railroads in the first quarter of this year was down nearly 30 per cent from the net for the same period of 1948, and down 14.5 per cent from the first three months of 1949. Nor is the railroad outlook for the rest of the year much better, even though general business activity is expected to be good. April revenues decreased 3.5 per cent from the same month in 1949. The firemen's strike will play hob with May figures.

The major explanations for the showings are: Loss of business during the coal and other industrial strikes that have plagued the country since the end of the war and loss of business to rival forms of transportation. A decline in freight carloadings in the past three years (see the carloading chart) reflects both these factors.

Rail Carloadings Fall



Source: Association of American Railroads; figures for Class 1 lines

Out of proportion — But freight carloadings in the first 1950 quarter fell only 15.7 per cent from the first 1948 quarter. Net income fell nearly 30 per cent in that time. Carloadings dropped 8 per cent from last year's first period to this. Income was off 14.5 per cent.

Why the difference? Revenues from passenger volume don't vary enough to explain it. The answer is that the railroads, like other industries such as steel that are saddled with heavy fixed charges, are hit in the dollar plexus out of proportion to the business volume they may lose. In the first quarter of this year, total operating revenues were down $258 million from the first quarter of 1948, but total operating expenses for the period fell only $198 million. Total operating revenues in the first three months of this year were $165 million below revenues for the first 1949 period, but total operating expenses fell only $150 million.

Cooking Equipment Sales Up

Sales of Hotpoint Inc.'s commercial electric cooking equipment in 1949 were 25 per cent above the record set in 1948. Business volume of this department has increased more than 65 per cent in just two years, says James J. Nance, president.

About 25 per cent of the cooking done in the U. S. today is in commercial kitchens that turn out 62 million meals every 24 hours.

Sylvania Reopens Tube Plant

Sylvania Electric Products Inc. will temporarily reopen its radio tube plant in Altoona, Pa., on a limited basis. Improved demand dictates the move. The Altoona plant was closed in July, 1949, when sales of radio tubes dropped.

U.S. Steel To Make Iraq Pipe

Consolidated Western Steel Corp. has received an order from the Iraq Petroleum Co. Ltd., London, England, for 500 miles of 30-inch and 32-inch pipe to be used in laying the 566-mile pipeline from the Kirkuk oil fields of Iraq to the eastern Mediterranean.

All of the plate for the 166,000 tons of pipe involved in the current order will be made by western steel mills. First shipments of pipe from the West Coast to the Persian Gulf will be made next September and approximately a year will be needed to complete the contract.

National Tube Co. also has received an order for 93 miles of pipe from the Iraq firm.

Men of Industry

Charles A. Butcher will join **Worthington Pump & Machinery Corp.** June 1 as assistant to the president. He formerly was general manager, Crocker-Wheeler Electric Mfg. Co. and vice president of its successive parent companies, Joshua Hendy Corp. and Elliott Co. Mr. Ramsey will make his headquarters in New York.

C. B. Vernooy, comptroller, Geneva Steel Co., Utah subsidiary, United States Steel Corp., New York, was appointed assistant comptroller of **U. S. Steel Corp.,** effective July 1. He joined American Steel & Wire Co. in 1919. He was elected comptroller and secretary of U. S. Steel Supply Co., Chicago, in 1942, and in 1948 assumed his position at Geneva Steel.

Kaiser-Frazer Corp., Willow Run, Mich., elected as new directors **Sheldon R. Coons,** recently appointed general business consultant, and **Webb Wilson,** vice president and treasurer.

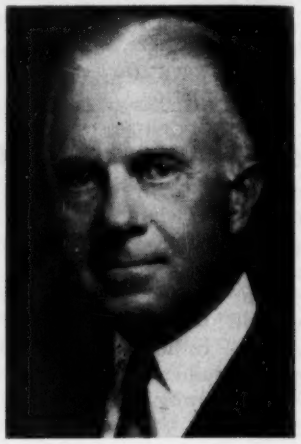
A. King McCord was elected president, **Oliver Corp.,** Chicago, succeeding **Alva W. Phelps,** who becomes chairman and chief executive officer.

George R. Weber was elected treasurer, **Raybestos-Manhattan Inc.,** Passaic, N. J. He succeeds **W. H. Dunn,** retired. **W. S. Simpson** was elected secretary and **W. Ward Kievit** a director. Mr. Weber, in addition to his new responsibility, is a director and vice president of the corporation, and also general manager, United States Asbestos Division, Manheim, Pa. Mr. Simpson, a director, is assistant general manager, Raybestos Division, Bridgeport, Conn., and Mr. Kievit, comptroller, relinquishes his position as secretary.

Cooper-Bessemer Corp., Mt. Vernon, O., engaged the full-time service of consultant **Robert P. Ramsey.**

Michiana Products Corp., Michigan City, Ind., added to its sales force **H. B. Scott, A. J. Popovich** and **L. S. Johnson.** Mr. Scott was with Calorizing Corp. as metallurgical engineer, and will be in charge of southern Indiana with headquarters in Indianapolis. Mr. Popovich, metallurgical engineer with Allis-Chalmers Mfg. Co., is in charge of northern Indiana territory with headquarters at the Michiana plant. Mr. Johnson, formerly with Midvale Corp., is assigned the Philadelphia area.

JOHN W. LOHNES
. . . V. P., Speer Carbon and subsidiary



G. G. COOLIDGE
. . . executive aide, Harbison-Walker

John W. Lohnes was elected vice president in charge of carbon and graphite sales, **Speer Carbon Co.** and its subsidiary, **International Graphite & Electrode Corp.,** both of St. Marys, Pa. He is succeeded as manager of sales for International Graphite by **Robert E. Rice. A. H. Toronski** was appointed chief engineer, carbon and graphite products, for Speer Carbon and **William E. Harvey** was appointed plant manager of all carbon and graphite plants of the parent company and its subsidiaries. Mr. Harvey formerly was plant manager, International Graphite, at Niagara Falls, N. Y.

Charles L. Freel was named administrative assistant to general sales manager, **George E. Tubb, Lord Mfg. Co.** He will have headquarters at the home office, Erie, Pa., and is succeeded as Detroit office manager by **Everett C. Vallin.**

A. E. Campbell was appointed sales manager, **Clapp Instrument Co.,** Webster, Mass.

Robert J. Cannon was elected president and treasurer, **Cannon Electric Development Co.,** Los Angeles. Formerly vice president and general manager, he succeeds his father, the late **James H. Cannon,** former president and founder of the firm. Other officers elected are **Richard L. Rowen,** vice president and production manager, and **John B. Milliken,** secretary.

Spang-Chalfant Division, National Supply Co., has transferred **Stuart Hatch** from the St. Louis sales office to similar duties as representative in the Pittsburgh district sales office.

G. G. Coolidge was appointed executive assistant to the president, **Harbison-Walker Refractories Co.,** Pittsburgh, in a move awaited since he relinquished the title of vice president in charge of sales last month due to company retirement policies. He continues as a director.

Edward R. Bergin was appointed sales engineer in New England by **Peterson Steels Inc.,** Newark, N. J.

Glenn R. Kraus and **Ernest C. Hawkins** have joined **Rees Machinery Co.,** Pittsburgh. Mr. Kraus formerly was associated with Mesta Machine Co. and Motch & Merryweather Co. Mr. Hawkins was with LeMaire Tool & Mfg. Co., John S. Barnes Corp. and Evans Tool Co.

Robert T. Wood was named chief metallurgist, magnesium products, **Aluminum Co. of America,** Pittsburgh, effective June 1.

United States Steel & Carnegie Pension Fund, a Pennsylvania corporation, elected **A. R. Mathieson** president and treasurer, **William C. Butler,** comptroller and secretary, **G. L. Thomas,** supervisor of pension administration, and **E. V. Russ,** supervisor of insurance benefits administration and assistant secretary.

John N. Welsh was named associate director and continues to head the engineering service of **Hall Laboratories Inc.,** Pittsburgh.

J. P. Barnum is sales representative, Warren Steel Division, **Copperweld Steel Co.,** in New England, and **H. M. MacDougal** holds a similar post

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ONE OIL DOES WORK OF TWO

Dual-Purpose Sunicut Replaces Two Former Oils; Dilution Ends; Finishes Improve; Tool Life Lengthens

When one oil does work formerly requiring two . . . and with marked superiority . . . it doesn't make good sense to keep on buying two.

That is precisely why a prominent ball bearing manufacturer changed to Sunicut. He had been using one oil for lubricating his automatics, and another for cutting, but without complete satisfaction. The lube oil kept diluting the cutting oil by leaking into it. As a result, he got poor finishes and tool life was short. A Sun representative, called in to study the situation, advised using a dual-purpose grade of Sunicut. Adoption of his recommendation solved the problem.

For three years now, Sunicut has been used by the entire automatic department with complete satisfaction. A year ago a switch was made to the *new* Sunicut with Petrofac, Sun's revolutionary all petroleum additive, and even better performance has resulted.

The new Sunicut grades, transparent and non-emulsifying, have been thoroughly "Job Proved." Excellent results are being obtained on automatics machining all types of steel and brass at all practical feeds and speeds. For further information, call or write your nearest Sun Office.

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SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®

in that territory for the company's Glassport Wire & Cable Division.

Walter F. Wilmas was elected executive vice president, **Pressed Steel**

WALTER F. WILMAS
. . . Pressed Steel exec. V. P.

Car Co. Inc., Chicago, succeeding the late **H. J. Gearhart.** He joined the company in 1945, became comptroller in 1946, vice president in 1948 and a director in 1949. Four new vice presidents elected are **Norman F. Garrett,** in charge of operations, and a director; **Harry J. Deibel,** purchases; **Charles S. Hanley,** production; **Clarence J. Plisky,** special structures program; and **Charles T. Davis,** sales.

Reed-Prentice Corp., Worcester, Mass., opened a new sales office in Chicago with **J. H. Wolcott** as manager and **Charles Holland** sales engineer. **Iver J. Freeman** succeeds Mr. Wolcott as manager of the Los Angeles office.

Nathan M. Levinson was appointed to the field engineering staff, **Sprague Electric Co.,** North Adams, Mass.

Guy L. Morrill, Pacific Division manager, was elected a director of **Midwest Piping & Supply Co. Inc.,** St. Louis, succeeding the late **W. G. Hooper.**

Howard E. Morison was appointed manager, agricultural sales division, **Crucible Steel Co. of America,** New York, succeeding **John J. Boylan,** resigned.

L. D. Whitescarver was appointed assistant manager, Lynn, Mass., turbine and gear sales division, **General Electric Co.'s** turbine divisions. He is succeeded as manager, Fitchburg, Mass., turbine sales division by **F. S. Kohl. G. L. Phillippe** is department comptroller, apparatus department, succeeding the late **G. S. Hyatt.**

Robert H. Heppel will head the Dallas operation of **Davies Supply & Mfg. Co.,** exclusive distributor in the Southwest for Udylite Corp.

Richard E. Hoagland was appointed vice president and assistant general manager, **Utah Fuel Co.,** subsidiary, Kaiser Steel Corp. He will have headquarters in Salt Lake City, Utah.

George O. Hendee, sales and service engineer in the Philadelphia area, **Hannifin Corp.,** was transferred as field service and sales engineer for New England, with headquarters at Worcester, Mass. He succeeds **Elliott D. Thompson,** who withdraws from that position after 20 years with the firm. **Joseph O'Malley** succeeds Mr. Hendee at Philadelphia, serving eastern Pennsylvania, southern New Jersey, and Delaware.

John L. Cotsworth was appointed manager of stainless steel sales for

JOHN L. COTSWORTH
. . . heads Atlas' stainless sales

Atlas Steels Ltd., Welland, Ont., Canada. For the last four years he was sales promotion manager, Chicago Steel Service Corp., and was previously for 11 years with Rustless Iron & Steel Division, Armco Steel Corp.

Bennett Machinery Co., New York, appointed **Jack Ettinger** regional representative in the New York metropolitan area. He will work directly from the Bennett plant in Clifton, N. J., serving machine tool users in New Jersey, New York and Pennsylvania.

Paul B. Kasakove was appointed factory superintendent, **Ediphone Division,** Thomas A. Edison Inc., West Orange, N. J.

John C. McLeod was appointed manager, Rusco belting sales, Chicago branch, **Russell Mfg. Co.**

Thomas O. Schrader Jr. was appointed sales manager, **Erie Iron Works,** Erie, Pa.

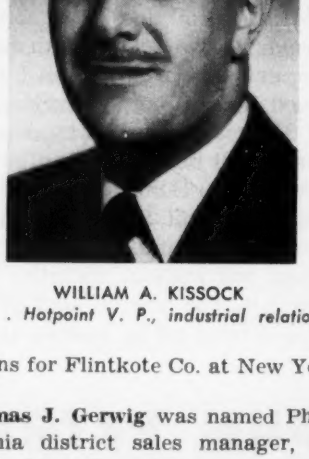
L. J. Amsdell was appointed director, Pipe Joint Division, **Gates Engineering Co.,** New Castle, Del.

New members appointed to the junior board of directors, **Dravo Corp.,** Pittsburgh, are: **Walter R. Hoffman,** Cleveland, district manager of Dravo's machinery division; **Lawrence M. Baker,** Pittsburgh, assistant treasurer and assistant secretary, Union Barge Line Corp. and Southern Transfer Co., Dravo subsidiaries; and **Robert A. Thompson,** Pittsburgh, field superintendent, contracting division.

Allis-Chalmers Mfg. Co., Milwaukee, appointed **Gilman Y. Murray** Los Angeles district sales representative, specializing in basic industries' products; **John J. Greagan Jr.** sales representative, Charlotte, Va., district office; and **Louis E. Lipphardt** sales representative, Boston district office.

John M. Urban, foundry superintendent and metallurgist for Fanner Mfg. Co., Cleveland, since 1939, was appointed technical service representative in the coke sales department of **Diamond Alkali Co.,** Cleveland. He will contact gray iron foundries and other users of industrial coke in northern Ohio, western Pennsylvania, western New York, and southeastern Michigan.

William A. Kissock was elected vice president of industrial relations, **Hotpoint Inc.,** Chicago. Before joining the company in 1949 as manager of that department, he headed industrial re-



WILLIAM A. KISSOCK
. . . Hotpoint V. P., industrial relations

lations for Flintkote Co. at New York.

Thomas J. Gerwig was named Philadelphia district sales manager, **Republic Steel Corp.** He succeeds **L. L.**

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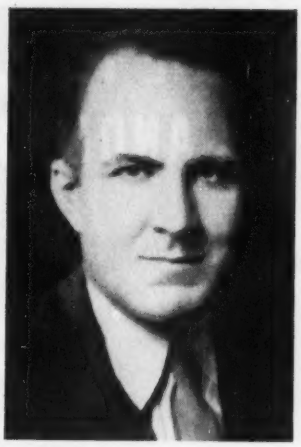
HAROLD B. RESSLER
. . . *Ryerson first vice president*



DR. KENT R. VAN HORN
. . . *Alcoa, asso. director-research*

Caskey, now in Republic's general offices in Cleveland.

Harold B. Ressler was elected first vice president, **Joseph T. Ryerson & Son Inc.,** Chicago. Since 1932 he has been vice president and general manager of sales. **C. L. Hardy,** former assistant vice president, was appointed assistant to the president, and **Thomas Z. Hayward** was appointed general manager of sales for the group of 13 Ryerson steel service plants.

Walter H. Bramman has joined the sales force of **Black & Decker Mfg. Co.,** Towson, Md. He will be located in Spokane, Wash., working with the company's electric tool distributors in the eastern part of the state as well as Montana and Idaho east of Boise, Idaho.

William Rodgers was elected to the board of directors, **Granite City Steel Co.,** Granite City, Ill., replacing **N. B. Randolph,** company president, whose health did not permit re-election to the board.

Thomas Whelan Jr. was appointed Houston district sales manager, **Patterson Foundry & Machine Co.,** East Liverpool, O.

Effective Aug. 1, **Dr. Kent R. Van Horn** will become associate director of research, **Aluminum Co. of America,** Pittsburgh, and **Herman E. Bakken** will become vice president and general manager, **Aluminum Ore Co.,** subsidiary company. Dr. Van Horn at present is an assistant director of research for Alcoa, and has been in charge of its branch laboratories at Cleveland since 1945. In assuming his new duties he will transfer to central headquarters of the research organization at New Kensington, Pa. Mr. Bakken has been associate director of Alcoa's Aluminum Research Laboratories at New Kensington.

Following his 65th birthday, **Mead L. Bricker** retired as a vice president and member of the administrative committee, **Ford Motor Co.,** Dearborn, Mich. He retains a directorship in the company and also will act as special consultant.

Maurice Nicholls has joined the staff of Kaiser Engineers Division, **Kaiser Industries Inc.,** Oakland, Calif. He adds naval architecture and marine engineering services to the organization and, in addition, will work with private and public agencies interested in engineering and construction services.

Newton D. Baker III was elected president, **Harris Products Co.,** Cleveland, subsidiary of Cleveland Graphite Bronze Co. He succeeds **Charles H. Bitzer,** who becomes chairman of the board. Mr. Baker became executive vice president of Harris last June, shortly after it was acquired by Cleveland Graphite Bronze, and continued as secretary of the parent company. He has resigned the latter position in order to devote full time to the subsidiary company, and **Charles Dilley** succeeds him as secretary. **Carl Dautel** becomes treasurer of Harris Products, resigning as assistant treasurer of Cleveland Graphite.

T. Clinton Fletcher was appointed resident manager of General Motors Corp.'s **Fisher Body** stamping plant in Grand Rapids, Mich. He succeeds **Frank B. Harrington** who will retire in October.

Weatherhead Co. of Canada Ltd., St. Thomas, Ont., Canada, appointed **Charles H. Wynn** as assistant general manager. He was formerly assistant general manager, Timken Roller Bearing Co. in St. Thomas.

Recent elections at **Macklin Co.,** Jackson, Mich., include: **M. T. Hunt,** appointed sales manager; **W. V. Blake,** vice president in charge of engineering; and **R. O. Lane,** vice president in charge of sales engineering. **B. F. McIntyre** retired in January as vice president and sales manager.

American Steel & Wire Co., Cleveland, subsidiary, U. S. Steel Corp., appointed as supervisors of engineering and maintenance **William H. Lyon,** Trenton, N. J., Works; and **Joseph A. Walsh,** New Haven, Conn., Works. **C. J. Petry** was named assistant division superintendent, steel works, South Works, Worcester, Mass.

OBITUARIES...

John A. Coakley, 68, president, **Automatic Sprinkler Corp. of America,** Youngstown, died May 18 in Cleveland, where he had made his residence. Formerly general traffic manager, U. S. Steel Corp., he also was chairman, Cleveland Stevedore Co., Brewsillon Co., Massillon, O., and Angus Mines Ltd., Toronto, Canada.

Lawrence F. Miller, executive vice president, **Steel Service Inc.,** Steubenville, O., and vice president, **Parkersburg Steel Co.,** Parkersburg, W. Va., died May 13 after several months' illness.

Sumner C. Hutchinson, 79, president, **Genesee Tack Co.,** Rochester, N. Y., died May 17.

Demarest Adams, 48, executive vice president, **Asbury Graphite Mills Inc.,** Asbury, N. J., died May 20 at his home in Easton, Pa.

George R. Probst, 54, manager of steam turbine sales, **Worthington Pump & Machinery Corp.,** Harrison, N. J., died May 14 in Wellsville, N. Y.

Joseph E. Holveck, 66, hydraulic engineer, **Worthington Pump & Machinery Corp.,** Harrison, N. J., died May 20 after a brief illness.

Walter G. Robbins, 48, president, **Carboloy Co.,** Detroit, died May 18 of a heart attack while on a business trip in Schenectady, N. Y.

Bradley S. Carr, 60, manager, pump department, Chicago Heights, Ill., **American Manganese Steel Division,** American Brake Shoe Co., died May 15. Mr. Carr held patents on dredge pumps and allied equipment.

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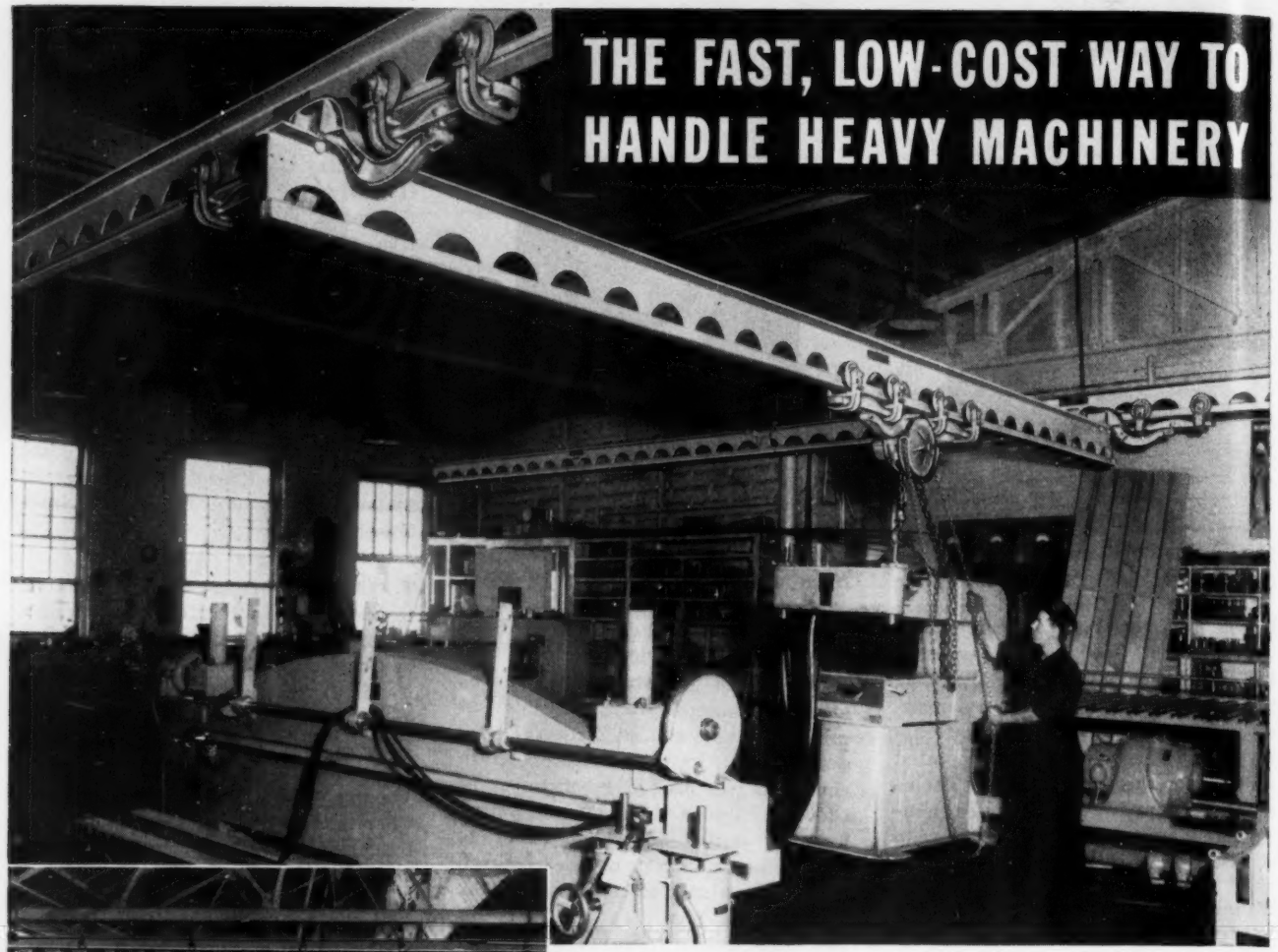
THE FAST, LOW-COST WAY TO HANDLE HEAVY MACHINERY



Hand-propelled crane with chain hoist handling heavy steel frame for veneer machine.

Hand-propelled crane with electric push-button operated hoist moving a diesel engine.

IF HARD back-breaking work is required on the part of several men to move a machine in your plant, you should seriously consider Cleveland Tramrail cranes.

A heavy engine or machine-tool can be quickly and safely moved by one or two men with a smooth running Cleveland Tramrail crane. Shipping boxes or crates are easily packed. Work that requires *hours* can often be done in *minutes* with an overhead crane.

Despite the great advantages Cranes provide, they are low in price. In fact, many completely pay for themselves in only a few months time. Cleveland Tramrail cranes are built in various types for manual and electric operation.

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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Production AND Engineering
NEWS AT A GLANCE

STICKS TO ODD-SHAPED PARTS—All surfaces of odd-shaped parts are evenly covered in a single-dip operation by a one-coat synthetic enamel developed by United Lacquer Mfg. Corp., Linden, N. J. Properties of the metal finish enable it to "break" at vital points and adhere to various types of metals. Gas ovens or infra-red lights can be used to bake the finish which is made in many colors. Since enameling of odd-shaped pieces normally requires more than one operation, the enamel is expected to yield considerable savings in manufacturing time and unit costs.

CLUNK—ZCUT—PLOP!—From press to chopper to hopper—in that simple order just about tells the story how Dumore Co., Racine, Wis., handles scrap metal at less than 10 per cent of its previous operational cost. The scrap which formerly came out of the plant's automatic punch press in long strips, is now cut up by a chopper as it leaves each press and is deposited in a large hopper. When full, a Towmotor truck appears on the scene, picks up the hopper and dumps it in another hopper in the plant yard.

OUTLINES THERMAL EXPANSION PROCEDURES—Ten methods for determining thermal expansion, and procedures employed to obtain expansion equations and coefficients of expansion of materials are included in a new publication, "Thermal Expansion of Solids", issued by National Bureau of Standards. Methods outlined include the micrometric, interference, fused-quartz tube and dial-indicator, and x-ray techniques. Also discussed are means for determining volume changes in metals and alloys during casting.

SOLVES AUTOMATIC CONTROL PROBLEMS—Ever try to establish the correct control mechanism for cutting an irregular pattern by using an automatically-controlled lathe—before constructing equipment? It can be done now by means of a servomechanism kit developed by Claude Neon Inc. The high performance servo "package", which can be assembled as easily as a toy erector set, solves one of the toughest and most expensive problems facing the development laboratory in designing new mechanisms—translating the blueprint or schematic diagram into a working model. The kit, the company says, helps the engineer interpret the "rights" and "wrongs" in equipment design, eliminating need for expensive drafting, machining and assembly work.

REPRODUCES ENGINEERING DRAWINGS QUICKLY—Rapid production of quality shop prints is assured by a photosensitized cloth reported by Eastman Kodak Co., Rochester, N. Y. Development produces positive copies directly from positive original drawings eliminating the conventional negative step previously required. It can be handled in normal room light and exposed on conventional blueprint or direct-process machines or a vacuum printing frame.

HELPS EFFICIENCY—Understanding the purpose or function of metalworking fluids in grinding and cutting operations, as well as necessary service characteristics is a prerequisite for applying fluids with maximum efficiency. While emulsions are generally lower in cost than oil type fluids, this is not universally true, dependent upon facilities for handling and care of the fluid in service, the frequency of necessary change, etc. Some valuable tips on how to choose the correct fluid to meet your particular requirements are supplied by Mr. Bastian of Shell Oil Co. (p. 58)

NEW EXTRUSION METHOD—Definite possibility of soon constructing aircraft fuselages and floors without internal spar bracings is seen as a result of a newly-developed process for extruding integrally-stiffened aluminum "skin". By the new method, aluminum and skin stiffening elements of planes are made in one piece in contrast with the conventional structure which is built of many fabricated sheet metal parts. The method also would help shortcut assembly time of aircraft. It is estimated to reduce number of attachment operations by about 60 per cent. (p. 63)

QUALITY PLUS—The fact that coke ovens sometimes last over 30 years bears mute testimony to the quality of the brick made by refractory manufacturers. Coke oven refractory manufacture is costly, complicted, painstaking to combat the numerous destructive causes of by-product ovens. The oven high-temperature sections are subjected to comparatively severe loads, abrasion and thermal shock, and conditions in other sections are generally similar. These destructive forces work together to cause a gradual bulging or "bellying" of oven walls, even when brick of top quality are used. (p. 64)

ELECTRONICS PAY OFF—Difficult tasks in the steel industry requiring superior response, speed or sensitivity are performed at less cost by electronic equipment, American Iron & Steel Institute members were told last week. Electronic devices now control bessemer converter operations, gage thickness of steel strip on high speed mills. (p. 74)

Use the right

MACHINING AND DRAWING FL

... to improve production efficiency

Selection and application of cutting and grinding fluids and drawing oils and compounds can be extremely complex if the nature of these metal-working fluids is not understood. Here is some valuable advice on how to choose the correct fluid to meet your machining or drawing requirements

SELECTION and application of cutting and grinding fluids and of drawing oils and compounds in metal-working plants often pose perplexing problems. Understanding the purpose or function of metalworking fluids, as well as necessary service characteristics is a prerequisite for applying fluids with maximum efficiency.

Cutting and Grinding Fluids—The two commercial types of cutting and grinding fluids commonly used in industry are (1) oil type fluids and (2) water emulsions or solutions.

The oil type fluids include the following groups:

A. Inactive Oils: 1. Mineral oils, 2. fatty oils or mineral-fatty blends, 3. inactive sulphurized fatty-mineral blends.

B. Active Oils: 1. Dark sulphurized mineral oils, 2. transparent sulphurized oils, 3. sulpho-chlorinated oils, 4. fatty compounded sulphurized or sulpho-chlorinated oils.

The terms "active" and "inactive" indicate chemical activity, or the ability of certain components in the fluid to react with the metal surface at operating temperatures in order to change the conditions of machining. Specifically, the reactivity of the cutting fluid with copper is measured at an elevated temperature (from 200° F to 400° F dependent upon test

Fig. 1—Cylindrical grinding with an emulsion coolant. Courtesy Brown & Sharpe Mfg. Co.

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By E. L. H. BASTIAN
Staff Engineer
Shell Oil Co.
New York

NG FLUIDS

Fig. 2—Automatic screw machining with an oil type cutting fluid. Courtesy Brown & Sharpe

method) to ascertain whether it is "active" or "inactive".

Inactive Oils—"Inactive" oils are generally used to machine brass or other copper alloys susceptible to staining by sulphur or chlorine compounds. Typical "inactive" oils are straight mineral oils, fatty oils (such as lard oil), mineral-fatty oil blends, and mineral oils containing sulphurized fatty oil bases or compounds.

The latter are referred to as "inactive" sulphurized cutting oils. The sulphur contained in the fatty compound is so firmly attached chemically that practically none, or very little, is released at tool point operating temperatures to attack the work metal. This is advantageous where copper alloys are being machined or where brass or other copper alloys are employed in moving parts of the machine tool. Any staining, or corrosive attack of these would be obviously detrimental either to work finish or to machine operation.

The so-called "inactive" cutting oils and mineral fatty oil blends (usually about 15 to 20 per cent fatty oil) are considerably cheaper than straight fats such as lard, and performance-wise have replaced lard oil in many shops for nonferrous machining and for tool room use.

Active Oils—"Active" sulphurized mineral oils, used principally in the machining and grinding of steels, are the most widely used fluids in industry today.

For machining tough, stringy, low carbon steel the straight sulphurized mineral oils are mostly used. These appear to minimize the tearing and rough finish often encountered in machining of such metals. The "active" sulphur contained in the oil forms an iron sulphide film on the steel surface which because of lower shear strength and greater brittleness facilitates the cutting action.

High carbon and hard alloy steels are generally more readily machined and ground to smooth finishes with "active" oils containing fatty oils or equivalent compounds. The extra lubricating value of such formulations in machining hard metals is well borne out by experience.

Chlorine Compounds—Chlorine compounds, if chemically active at service operating temperatures, appear to act similarly to sulphur compounds but at lower temperatures, to form metallic chlorides at the interface. For relatively low surface speed machining of tough steels (such as in tapping or threading of stainless steels) the chlorinated or sulpho-chlorinated oils perform very well. Chlorine, released actively at lower temperatures, appears to act as a stop-gap between the polar type fatty oil compounds and the heavier E. P. (extreme pressure) films formed by active sulphur compounds at higher temperatures.

The dark sulphurized oils generally contain more sulphur than the newer transparent sulphurized oils, and are hence considered as "heavier-duty" where extreme chemical activity is desired. However, the use of new types of chemical additives and concentrates in transparent cutting oils is changing this situation to a considerable degree in modern practice.

Soluble Oils and Emulsions — Second commercial type of cutting fluid is the water emulsion or solution. Such fluids are made by mixing either a soluble oil or a paste type emulsion compound with proportions of water which are dependent upon the intended end use, and by methods of mixing dictated by the compound used.

Most commonly used soluble oil is a medium viscosity mineral oil containing an emulsifier base or soap plus a coupling agent. The emulsifier may consist of sulphonates, acid sludges, glycols, saponified phenols or naphthenic acid, and the coupling agents may be alcohols. The soluble oil may contain fatty oils, fatty acids, a wetting-out agent, water softening agents, germicides, and water. All soluble oils are usually liquid, and mix readily with various proportions of water.

Paste type compounds are usually composed of soaps, fatty oils, fatty acids, and water. They may contain mineral oils, other emulsifying agents, resins, and germicides. The pastes usually mix well with water to form an emulsified coolant, which is higher in lubricity than soluble oil emulsions.

Heavy Duty Types—In addition to the more conventional cutting and grinding emulsions, whose prin-

Fig. 3 (left)—Rough turning and facing a double bevel gear with high speed steel tools and using coolant on a Lodge & Shipley Duomatic lathe. Courtesy Lodge & Shipley Co.

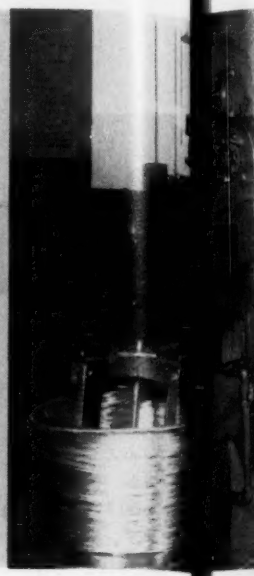

Fig. 4 (right) — Continuous "wet wire" machine drawing copper wire. Courtesy American Brass Co.

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cipal function is cooling, newer industry developments have resulted in so-called "heavy-duty" type soluble oils and emulsions. These contain active chemical compounds and additives which enhance the emulsion's ability to provide not only physical cooling, but lubrication and surface active chemical effects useful in machining and grinding.

In many cases, such heavy-duty emulsions have satisfactorily displaced oil type cutting and grinding fluids for operations like broaching, gear hobbing, and turning. Since cooling by the emulsions is superior to that obtained by oil type fluids, smoking and fogging from heavy cuts is eliminated. Due to their formation, the heavy-duty emulsions otherwise compare favorably with the oils in securing good machining finish and tool life. The latter, however, is generally better where oils are used.

In order to get the desired machining results from heavy-duty soluble oils, they must be used in much richer concentration emulsions than is the case for the conventional soluble oils. Whereas the latter are mixed with from 20 to 30 parts of water for machining, as a rule, the heavy-duty soluble oils are usually mixed with from 6 to 8 parts of water and rarely with more than 10 parts for best results.

In grinding, however, both conventional and heavy-duty soluble oils are used with from 40 to 100 parts of water, dependent upon wheel type, finish desired, and the grinding oil formulation.

Precautions in Mixing—In mixing up emulsions for either cutting or grinding, there are a few simple precautions to get the best results. First, the oil should always be added to the water, never the reverse, in order to get good normal emulsions. The water should be agitated well both while the oil is being added, and immediately afterward, to insure a complete, uniform emulsification of the mixture. If extremely hard water is encountered (above 400 to 500 ppm hardness) a water softener such as trisodium phosphate or one of the commercial softeners may be desirable. Dependent upon the degree of treatment desired, one or two pounds per hundred gallons of water is usually adequate.

Concentration of oil in the emulsion in service should be checked at periodic intervals, and necessary replenishment made of either oil or water to adjust back to the originally mixed proportion. In both machining and grinding use, oil is lost from the emulsion by carry-off on work pieces, and water is lost by evaporation due to heat generated at the tool points.

Application of Cutting and Grinding Fluids—Selection and application of a cutting or grinding fluid is influenced by a great many factors, including considerations of cost, necessary function, excellence of results required, and the engineering facilities to best utilize the fluid and qualify the results obtained. While emulsions are generally lower in cost than oil type fluids, this is not universally true, dependent upon facilities for handling and care of the fluid in service, the frequency of necessary change, etc.

With respect to function, obviously, the emulsions and water solutions are outstanding coolants, the oils are usually the better lubricants, and either class may be chemically endowed with properties to provide E. P. (extreme pressure) or antiwelding characteristics.

Quality of machining or grinding results desired

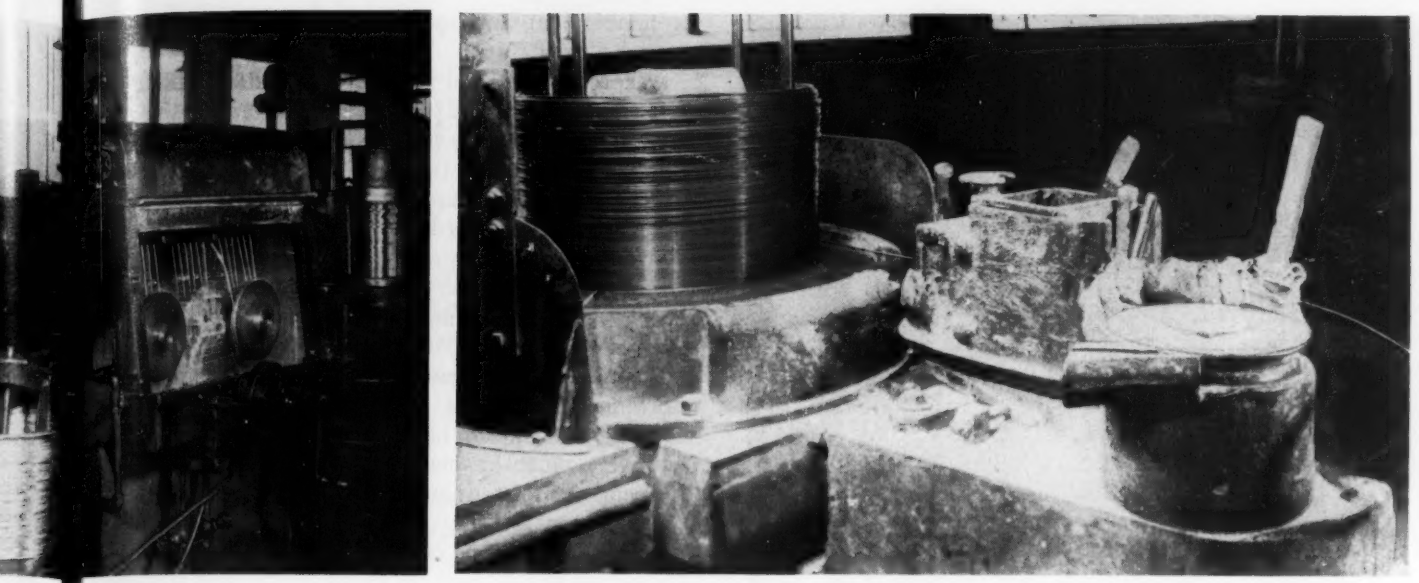

Fig. 5—General view of single-draft draw block showing die assembly equipped for dry or grease-type lubricants. Courtesy Carpenter Steel Co.

and possible are best known to each plant individually. As a general guide to selection of appropriate types of fluids for various operations refer to Table I. The identification of such cutting and grinding fluids is shown in this table.

Purpose of Drawing Fluids and Compounds—Second major group of metalworking fluids used in industry is made up of drawing fluids and compounds. Purpose of these in all cold drawing work is primarily to:

1. Cool the dies and work material.
2. Lubricate between dies and work.
3. Prevent "pickup" of work metal on dies, i.e., prevent metal adhesions or welding.
4. Cushion the dies in drawing.

It will be observed that these functions are the same or similar to those ascribed to machining fluids. While the details of method by which metal deformation is obtained are different here, the functions or purposes of cooling, lubrication, and antiwelding are more or less self-explanatory to tool engineers. Frictional heat and heat generated by deformation of metals under very heavy pressures obviously require some cooling action to maintain equilibrium operating temperatures in a range compatible with reasonable die life and maintenance of necessary die surfaces.

High Pressure Conditions—Under the conditions of high pressure, characteristic of drawing work, the functions of lubrication and antiwelding listed above probably become very closely interrelated. Lubrication here is undoubtedly boundary lubrication, wherein much higher friction coefficients prevail than is the case for ordinary fluid or hydrodynamic lubrication.

In the latter, dependence is made upon maintenance of a thick film of lubricant between metal surfaces. This film completely separates the surfaces and hence controls the relationship of forces (including frictional forces) which apply. A common example is in the lubrication of a simple journal and sleeve bearing, wherein a film of oil is constantly maintained between the two by the well known "wedging action" of the fluid. Here, however, unit pressures may be only several hundred pounds per square inch.

In deep metal drawing, unit pressures may be on the order of several hundred thousand pounds per square inch, with such pressure applied intermittently, and within very short periods of time. Such conditions cause rupture of ordinary lubricant films, allow metal-to-metal contact, the generation of high spot temperatures, and will cause welding, die failure and torn work, unless the die lubricants that are used can provide what is known as boundary lubrication.

How Lubrication is Obtained—Mechanisms by which such lubrication is obtained, are quite complex. Physical adsorption, the action of polar compounds, and chemical actions of several sorts at the metal surface all play a part here.

For some classes of drawing, as in heavy press drawing and tube drawing over plugs, certain metals, such as work hardening grades of steel, cannot be formed except by application of a solid coating material. Typical of such materials are (1) nonmetallic minerals such as clay, talc, and carbonates, and (2) soft metals, such as lead.

Use of solid lubricants such as pigmented compounds and soft metals thus serves the function of cushioning the die on the work piece also.

Types of Drawing Fluids and Compounds—Most important drawing fluids and compounds are: 1. Drawing oils, 2. emulsions, aqueous solutions, slurries, 3. solids—a. nonmetallic and minerals, b. soft metals.

Application of Drawing Fluids and Compounds—There are essentially three groups of drawing operations wherein fluids and drawing compounds are applied. These are: 1. Blanking, stamping and press drawing. 2. Bar and tube drawing. 3. Rod and wire drawing.

Press Drawing — Specific conditions regarding nature of work material, whether ferrous or non-

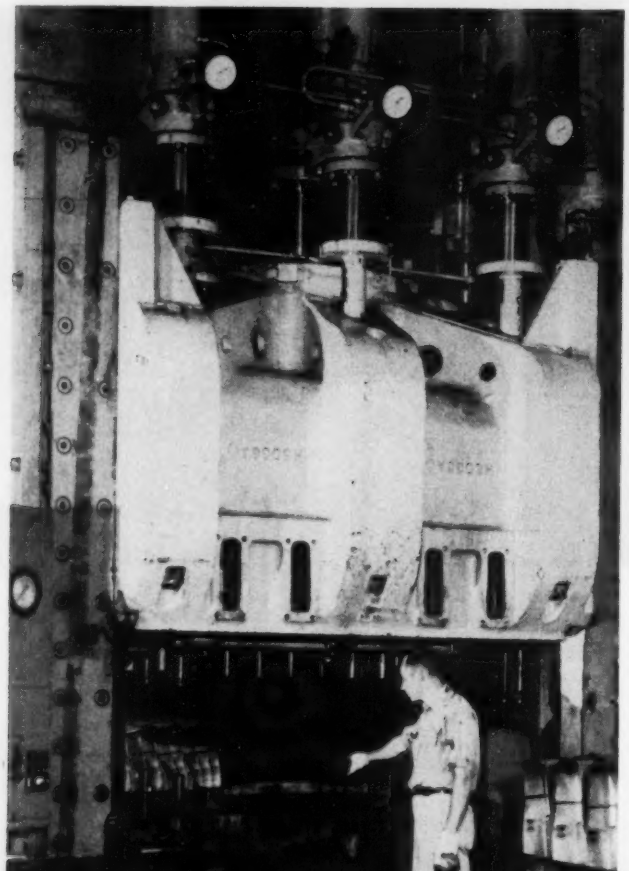

Fig. 6—Deep press drawing steel blanks with hydraulic press. Courtesy Birdsboro Steel Foundry & Machine Co.

ferrous, size and thickness of blanks, per cent reduction to be made in the draw, and facilities for lubricant application and cleaning all have a bearing on the choice of drawing oil or compound.

For carbon and low alloy steel drawing, a pigmented soap fat paste type product is usually employed, although for blanking, stamping, and shallow draws, a nonpigmented soap-fat compound or even an oil may be used.

Where a compound is used, the dilution will depend upon the severity of the draw. Generally, the more severe the draw, the more concentrated the emulsion required. From one to three parts of water per part of compound is common practice. Application may be by dip, swab, brush, wiper, roll, or circulation. However, circulation of heavily pigmented emulsions is not usually desirable since the pigment may settle out, clog lines and make it necessary to shut down the press.

Stainless Steel Drawing—For stainless steel press drawing of all kinds, the heavy chlorinated type of drawing oils appear best for performance. Such oils, however, must be cleaned off with trichlorethylene to secure complete removal.

Aluminum is easily press drawn either with compounded mineral oils or soap-fat compound emulsions. The latter should be high in free fatty acid for necessary good "wetting-out" of the aluminum surface and to avoid the staining effects of high alkalinity on the metal. Aluminum is "stretch-drawn" cold with bar soap, paste compound slurries, or grease, and hot "stretch-drawn" with soap, graphite, or by use of a spun glass blanket between the work and the forming dies.

Magnesium is always drawn hot (450-700° F) to secure the necessary ductility for drawing without fracture. For press drawing, graphite suspensions in a light volatile petroleum vehicle are commonly used. The vehicle flashes off the hot dies and work, leaving the graphite behind to lubricate and protect the dies.

Copper and brass press drawing is best done with either a fatty-mineral oil, a fatty oil, or one of the soap-fat paste type slurries. For heavy draws and cupping of some brass and bronzes, a moderately pigmented compound is used. The compound should contain 5 to 10 per cent pigment and be mixed with from two to three parts of water for application.

Bar and Tube Drawing—Steel bars are drawn with either a heavy oil or with a precoating of dried soap-fat "dope". Steel tubes are usually precoated with "dope" or compound pre- (*Please turn to Page* 80)

TABLE I
CUTTING AND GRINDING FLUID RECOMMENDATIONS

Operation	Steel: Low Carbon	Steel: High Carbon and Alloy	Steel: Stainless and High Alloy	Cast Iron	Nickel and Monel	Copper	Brass and Bronze	Aluminum	Magnesium
Broaching	F	F	H	D10	F	B	C	C	B
Threading	E	F	H	D10	F	B	C	C	B
Gear Cutting	E	F	H	D20	..	..	B	..	..
Drilling and Reaming	E	F	H	D20	E	B	B	B	B
Boring and Turning	D20	J10	J5	..	E	D30	D30	D30	B
Automatic Screw Machining	E	G	G,H	..	G	A	B	C	B
Milling	D20	D20	J5	D20	F	D30	B	D30	B
Thread Rolling	F	F	F	..	..	A	C	B	A
Sawing	D30	D30	D30	D30	D30	D30	D30	D30	B
Thread Grinding	G	F	F	..	..	..	C	C	C
Other Grinding	D50	D50	D50	D40	D50	D50	D50	D50	B

LEGEND—Types of Cutting and Grinding Fluids Recommended

"INACTIVE" TYPES
A—Straight Mineral Oil S.S.U. 100-150 @ 100° F. Viscosity
B—Mineral-Fatty Oil
C—Mineral Oil plus Sulphurized Fatty Oil
D—Soluble Oil (See Note 1)

"ACTIVE" TYPES
E—Sulphurized Mineral Oil
F—Sulphurized Mineral—Fatty Oil
G—Sulpho-Chlorinated Mineral Oil
H—Sulpho-Chlorinated Mineral-Fatty Oil
J—Heavy Duty Soluble Oil (See Note 1)

Note 1—Suffix number following designated soluble oil recommendation indicates water dilution to use. Thus: D20 signifies a 1 to 20 oil/water mixture. Never use emulsions for machining magnesium.

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NEW ALUMINUM EXTRUSION PROCESS

May Simplify Aircraft Construction

Improved mass production methods and considerable savings in manufacturing and materials costs seen in method of producing skin and skin-stiffening elements as one unit

MILITARY aircraft wings and probably fuselages and floors built without internal spar bracings are seen as a definite possibility as a result of a newly-developed process for extruding integrally stiffened aluminum "skin". The process was revealed at a technical conference held at Phoenix, Ariz., April 6-7 under sponsorship of the Air Materiel Command, Wright Field, Dayton, O., in co-operation with Reynolds Metal Co., who developed the process.

By the new method, the aluminum skin and skin stiffening elements are made of one part, in contrast with the conventional structure which is built up of many fabricated sheet metal parts. According to aircraft engineers, structures built with integrally stiffened sheet weigh about 10 per cent less than conventional structures. Number of attachment operations and of separate parts is reduced by about 60 per cent. Cost reduction is about 10 per cent.

More important than the cost and weight considerations is the fact that integrally stiffened skin requires only a small fraction of the aluminum ingot capacity and machine tool capacity which are required for machined stiffened skins.

Ribbed sheet is extruded hot from a hydraulic extrusion press in the form of a tube, Fig. 1. Tube is straightened by stretching it slightly past the elastic limit. It then is slit to open the circular cross section. A flat sheet is subsequently obtained by a series of operations to open the circle and flatten it out.

One of the problems is to control uniformity of wall thickness. One of the reasons the circular shape was selected is because a die for this shape is symmetrical and the forces developed in extrusion are exerted uniformly. Thick and thin sections must be avoided because the metal will tend to flow erratically through such a die.

Die Openings—Effect of die opening size is self-evident. However, width of sheet is not limited to diameter of die but rather by the collapsed shape which can be folded in it. For the ribbed sheet, a circular section is most practicable as it is symmetrical while allowing for a rather large collapsed shape. For a die opening of about 10 inches, it is practical to extrude a 9-inch diameter shape which can be slit and flattened to produce a ribbed sheet about 27 to 28 inches wide. Assuming the die opening as the limiting factor, a die 20 inches in diameter would permit production of a ribbed sheet about 5 feet wide.

First design worked out as an extrusion involved a 4-inch diameter tube with a $\frac{1}{8}$-inch wall. Most of the development work has consisted of going to thinner walls and larger diameter. At the same time, it was desirable to go from the 61S alloy, easily extruded, to strongest alloy, 75S (difficult to extrude).

After developing several intermediate sizes and learning how to extrude them satisfactorily in 24S (an intermediate alloy), work has now progressed to extruding a 9-inch diameter section with a 0.040-inch wall in 75S alloy.

Fig. 1 (above)—Ribbed sheet is extruded from press in the form of a tube

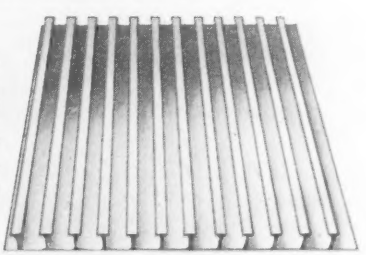
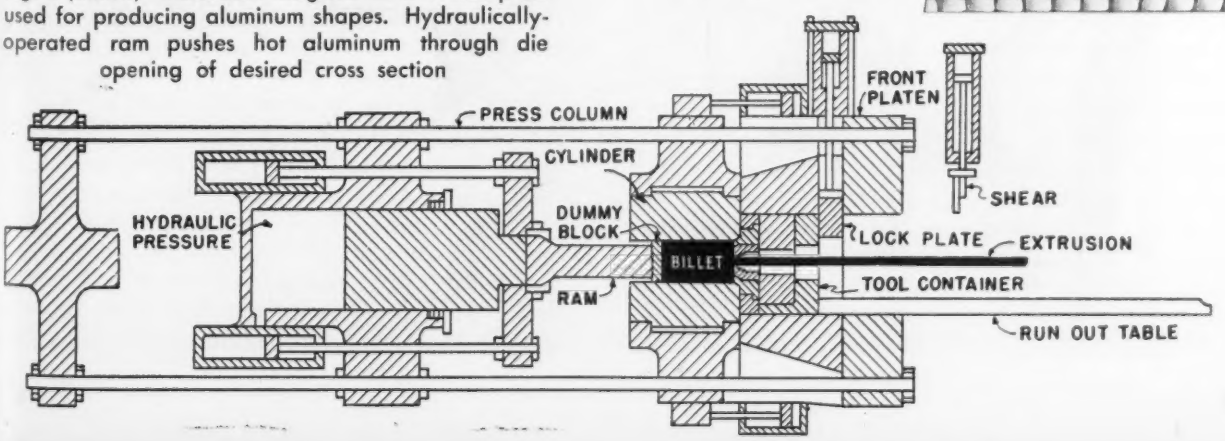


Fig. 2 (right)—This tube is then slit lengthwise along dotted line and opened up by a series of straightening and stretching operations to produce ribbed sheet shown here

Fig. 3 (below)—Schematic diagram of extrusion press used for producing aluminum shapes. Hydraulically-operated ram pushes hot aluminum through die opening of desired cross section



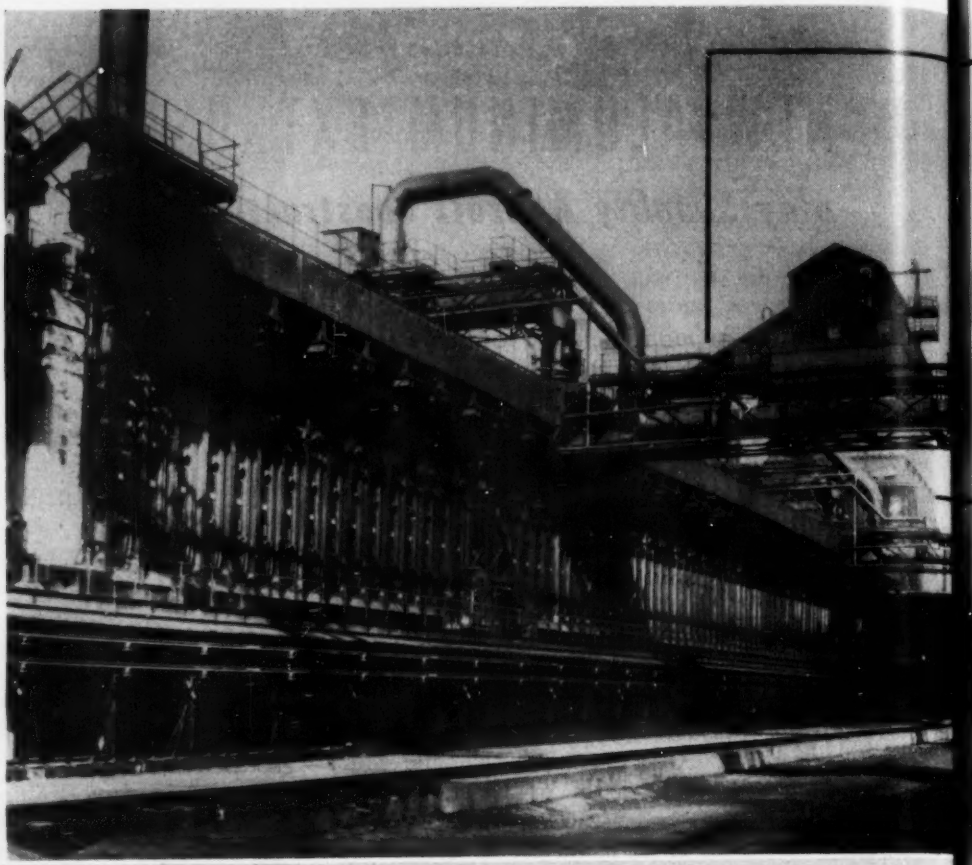
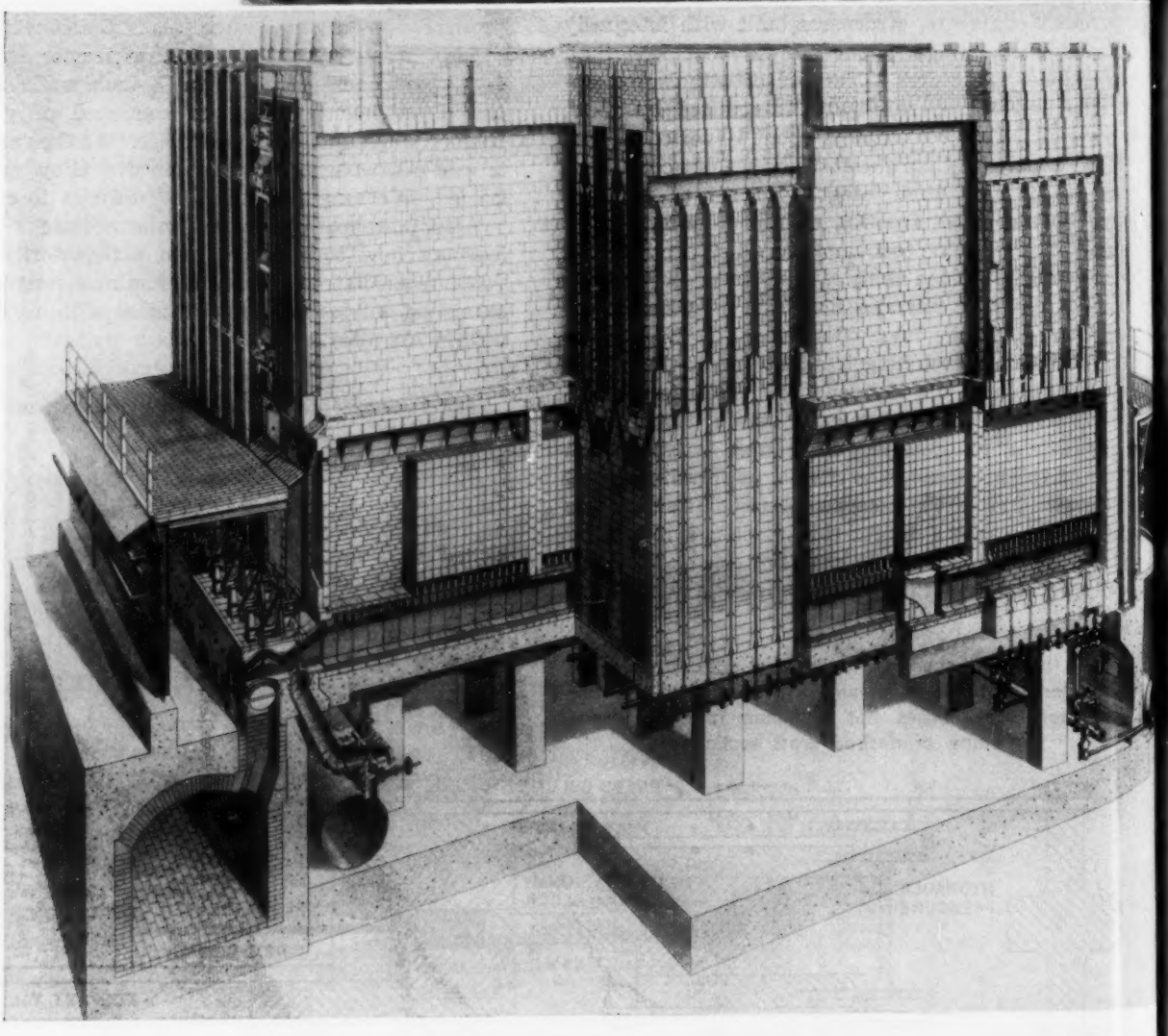


Fig. 1 (right)—Koppers-Becker "gun flue" type coke oven battery in a large steel plant. Courtesy of Koppers Co. Inc.

Fig. 2 (below)—Schematic drawing of Wilputte underjet type coke oven showing oven brickwork. Courtesy Wilputte Coke Oven Division, Allied Chemical & Dye Corp.



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PROPER COKE OVEN REFRACTORIES

Reduce Overhead Costs

By R. P. HEUER
Vice President
and
C. E. GRIGSBY
Service Research Engineer
General Refractories Co.
Philadelphia

A battery of by-product coke ovens is one of the most complicated and costly of refractory-lined structures. Therefore, it is most important that the correct types of refractory material be used to avoid too frequent oven repairs with their attendant loss of production

PART I

COKE is one of the most familiar and taken-for-granted yet vitally important products of the modern industrial world. No other fuel can compete with it for trouble-free, low-cost operation of modern blast furnaces and cupolas. The present state of development of these fast, efficient ironmakers was made possible by strong, porous, fast-burning metallurgical coke. For all practical purposes, therefore, coke is as important as the iron it produces.

In the "charcoal era", from 1620 to 1840, so much wood was used to make charcoal for blast furnaces that there arose an urgent need for a more readily available fuel. This situation sparked experiments with raw coal and coke, but charcoal still was dominant until 1855. The impracticability of using charcoal in modern furnaces is readily seen when you consider that it would take a cordwood pile (4 feet wide x 4 feet high) 5 miles long to make charcoal for the pig iron produced daily by a 1500-ton blast furnace. On this basis, a belt of cordwood 2 miles wide by 4 feet high, spanning the continent from New York to San Francisco would have been needed to furnish charcoal for the 2 billion tons of pig iron produced in the U. S. since 1875.

Raw anthracite coal became the leading blast furnace fuel about 1855, but it was too slow, and after 20 years, beehive coke supplanted it to make possible an increase in the rate of iron production. This type of coke was used in most iron furnaces until the end of World War I. Raw bituminous coal, popular from 1860 to 1890, was never in the lead. Today, the only use of raw coal in blast furnaces is in those rare instances when it is mixed with coke.

Since 1855, the use of charcoal has decreased steadily until it is now used for the production of less than one-tenth of 1 per cent of this country's pig iron. For the past 100 years, therefore, the dead and metamorphosed forests of prehistoric ages—in the form of coal—have been literally resurrected from their graves and used (with or without coking) to give a new lease on life to today's growing forests.

Beehive Ovens Waste Valuable Products—In 1893, the unbelievably efficient by-product ovens—which waste nothing—presented the first serious challenge to beehive ovens. Even the first small by-product ovens produced coke three times as fast as the beehive ovens of those days and could use coals unsuitable for beehive production. Prime disadvantage of beehive ovens is their shameful waste of valuable volatile products, which can easily mean the difference between profit and loss. Thus, despite their higher cost, the productivity and amazing efficiency of by-product ovens soon forced their acceptance as an important source of coke.

Between 1895 and 1905, while by-product ovens increased twenty-fold, beehive ovens did not quite double in number. Five years later, beehive ovens reached their peak with over 100,000 ovens, but some 4000 by-product ovens averaged 5 times as much coke per oven. This sealed the doom of the obsolescent beehive ovens, and from then on they steadily decreased in number, while by-product ovens continued to multiply.

The final showdown came during World War I, when by-product ovens were averaging almost 8 tons per day compared to 1 ton for their rivals. In 1919, by-product ovens at last exceeded beehive ovens in total tons produced—never again to be overtaken.

Once they had forged ahead, by-product ovens rapidly increased their lead. In 1935 they reached their peak, producing 97.4 per cent of all oven coke—a record they duplicated in 1938. During World War II, the larger, improved by-product ovens averaged over 12 tons per day—practically 10 times the average output of beehive ovens. Thus for more than 40 years, by-product ovens have produced by far the greater part of the metallurgical coke used in blast furnaces and cupolas. In 1949, they produced 94.6

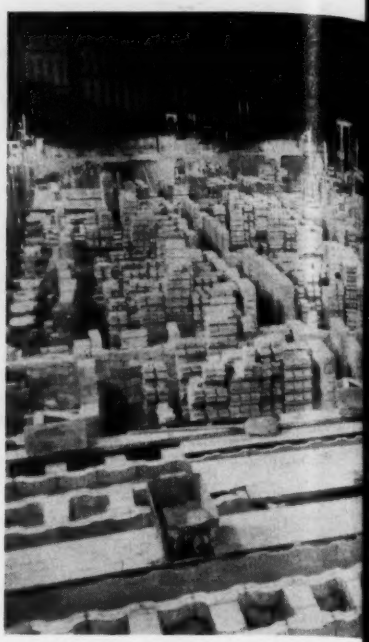

Fig. 3 (left)—View showing oven brickwork to course 37 of a Wilputte coke oven battery

Fig. 4 (center)—View of oven brickwork at tier 53 and stock in background for use in a Koppers coke oven battery

per cent of all oven coke, with beehive ovens accounting for the remainder.

In blast furnaces, a ton of coke normally produces well over a ton of pig iron; in cupolas it may produce from 4 to 10 or more tons of molten metal for use in castings. Since iron and steel products are vital to our civilization, no words can fully express the importance, in the industrial scheme, of the coke used in producing them. Modern civilization is dependent for its very existence upon a never-ending supply of metallurgical coke.

In order of importance, the three principal types of ovens are: By-product, beehive and flat.

Beehive ovens are used largely to supplement by-product ovens in periods of high demand for steel. During World War II about 8000 beehive ovens were reactivated in the United States. From 1942 to 1948, however, capacity of steel mill beehive ovens dropped one-third, while by-product oven capacity increased nearly 20 per cent. This shows that steel mills are again replacing beehive ovens with by-product types, and that beehive ovens are doomed to a role of ever-decreasing importance in modern industry.

Flat ovens are used primarily to produce petroleum coke, but they also convert coal into a very pure coke for the aluminum industry. Some steel companies are said to be considering them for coals having unusually high expansion. By-product ovens are by far the most important type.

By-Product Ovens—Most large steel plants produce their own coke in by-product ovens near their blast furnaces. These ovens in 1948 produced more than 80 per cent of all oven coke. As of Jan. 1, 1949, steel mill ovens totalled 12,156—about 80 per cent of the 15,139 by-product ovens then in existence (an all-time high for this country). The remaining 2983 ovens were located in coke, gas and chemical processing plants.

As of January 1, 1950, the American Iron and Steel Institute reports, the steel industry's coking capacity included 62,283,490 tons from by-product ovens and 3,185,750 tons from beehive ovens for a total of 65,469,240 net tons of coke per year. Thus, the capacity of by-product ovens is equal to 95.3 per cent of the total for the steel industry.

A battery of by-product coke ovens consists essentially of a row of narrow, vertical, virtually rectangular ovens side by side. In this unattractive, but highly efficient structure (See Fig. 1 and Fig. 2), a coking bituminous coal is subjected to destructive distillation to convert it to coke—a relatively pure form of carbon. The coke thus produced comprises about 75 per cent of the weight of the coal, and U. S. Bureau of Mines reported that in 1948 it was valued at 73.7 per cent of the total value of the oven products.

Working hand-in-hand with the oven is a variety of highly ingenious auxiliary equipment which treats the volatile products after they leave the oven. These products comprise a complex mixture of permanent gases, condensible vapors, and solids, which are converted into a multiplicity of highly useful and extremely valuable solid, liquid and gaseous by-products. Thus the by-products, pound for pound, are a trifle more valuable than the main product—coke. Is it any wonder that the name "by-products" for these valuable materials has become unpopular in recent years, or that some people no longer call these ovens "by-product" type?

The coking chambers, comprising the essential portion of the oven structure are separated by two refractory walls, held apart by vertical ribs. The walls and ribs enclose the regeneratively fired combustion chambers or flues (see Figs. 3 and 4). From these flues heat is conducted through the walls, to carbonize the charge.

Many Ovens Comprise Battery—A by-product coke

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Fig. 5 (right)—Hot coke being discharged from oven into quenching car at one of the large steel plants

oven battery may comprise any number of ovens served by a single stack. In one leading design there is always an odd number of ovens. In others, the number may be odd or even. Formerly, the number of ovens in a battery was from 5 to 87, with most batteries containing 25 to 75 ovens. Recently, however, two 106 oven batteries were built, each composed of two groups of 53 ovens which can be operated independently. Since they are both served by the same stack, the two 53 oven units comprise one 106 oven battery.

A battery of by-product ovens is one of the most complicated and costly of refractory-lined structures. It is erected with closest attention to detail, using special refractory brick manufactured to close tolerances by producers who are experts in this field. Each oven contains about 15,000 nine-inch equivalents of special fireclay brick and 25,000 nine-inch equivalents of special silica brick. On this basis a 106 oven battery would require more than 1½ million 9-inch equivalents of fireclay brick and over 2½ million 9-inch equivalents of silica brick. These 4¼ million brick are valued at only about 15 per cent of the total cost of the 106 ovens.

Initial cost of the refractories is far less important than the length of service they give, and oven brick must be of highest possible quality in every respect. The average life of ovens is more than 20 years, and according to the U. S. Bureau of Mines, 52 per cent of all ovens were more than 20 years old on January 1, 1948, (including 27 per cent more than 25 years old, and 13 per cent more than 30 years old). On January 1, 1949 half the by-product ovens in the U. S. were over 20 years old. More than one-third were over 25 years old. Such service requires refractories of top quality, carefully heated and not subjected to operating conditions as severe as those encountered in many other types of furnaces.

Effect of Service Conditions — Service conditions have a marked effect on the length of service of refractories. For example, an open-hearth steel furnace roof built of 12-inch silica brick often lasts only 3 months, while a 4 to 6-inch wall of silica brick between a by-product oven chamber and flue sometimes last 30 years or more. Silica coke oven brick may, therefore last 240 to 360 times as long as those of similar quality in the openhearth roof for equivalent brick thickness.

The fact that coke ovens sometimes last over 30 years—more than four times the expected life of blast furnace brick, bears mute but eloquent testimony to the excellent quality of the brick made by the expert producers of these important products.

Many Destructive Causes — There are numerous causes of destruction of by-product coke ovens. The high temperature sections are subjected to comparatively severe load, abrasion, and thermal shock. Conditions in corresponding sections of these ovens are generally similar, no matter what the oven design, but they may vary considerably with characteristics of the coal used and method of operating the ovens. The coking chamber face of the wall brick may have to resist load, abrasion, reducing gases and thermal shock.

Numerous other destructive forces work together to cause a gradual bulging or bellying of oven walls, even when brick of top quality are used. Causes of such distortion of walls may include expansion of the

coal, disruptive forces exerted by the pusher, and some expansion of the brick caused by conversion of most of the crystalline silica in the wall between oven and flues from cristobalite to lower density tridymite.

There may also be some permanent "growth" of the brick caused by the expansion and contraction which occurs when they are cooled and heated with each charge—some 10 to 20 thousand cycles in 30 years. Expansion caused by gradual growth of hard carbon deposits in the joints and at the oven ends may also be a factor in many cases.

Heating and cooling may also cause so much spalling at the oven ends that the coke is recessed into the spalled areas, causing hanging or sticking and difficulty in pushing. The relative effects of these forces may vary greatly in different ovens, but in all cases their combined effects eventually result in so much distortion of oven walls that the coke can be pushed out only with extreme difficulty, if at all. Wall distortion also causes cracks in brick or joints, or both, creating leakage and loss of efficiency. Eventually such distorted old ovens must be repaired, rehabilitated, rebuilt or replaced.

The coking chamber is sometimes operated under a slight pressure; at other times a slight vacuum prevails. The oven atmosphere is reducing and that of the flues is oxidizing. When the oven is operated under pressure, gas flows through the silica brick pores from the coking chamber to the flues, and the oven walls are under reducing conditions; under vacuum, the reverse is true. This probably has a great effect on life of refractories, but it has seldom been taken into consideration.

Abrasion and Thermal Shock Encountered—When the cold damp coal is dropped into the red hot oven chamber, refractories in the charging holes, sidewalls, and oven floor are subjected to abrasion and thermal shock many thousands of times during the life of the oven. The force of impact of the coal may also have an effect on the floor refractories. Although the temperature inside the oven drops very rapidly, it does not fall as low as 530° F—the upper limit of the critical temperature range for cristobalite inversion and hence of spalling of silica brick. (All service conditions, temperatures, etc. are taken from the Manual of ASTM Standards on Refractory Materials —1948.) In charging holes and oven floor, load is negligible and temperatures do not exceed 2190° F.

At intervals of 12 to 30 hours, a pusher is forced through each coking chamber, shoving the 8 to 12-ton residue of finished coke out into a quenching car (See Fig. 5). The head of this pusher is sometimes equipped with manganese steel scrapers which remove the carbon deposited on the oven roof. These scrapers are likely to remove some of the roof brick with the coke in each of many thousands of coke-pushing operations.

The only other force the brick in the major portion of the roof must withstand is moderate load, at temperatures up to about 2190° F. In the ends of the roof, the brick are subject to the same conditions as those in the roof proper, in addition to thermal shock when the doors are off.

Doors Subject to Spalling — The coke is pushed out in less than a minute, but the oven doors are usually off long enough for the door lining surface to cool to red heat or below, despite all efforts to protect it from the weather. Doors are also subjected to surface deposition of carbon—especially in cracks—and to carbon disintegration. Thermal spalling appears to be the prime cause of destruction of most door linings, but it is likely that this force is often supplemented by carbon disintegration below the fireface. It has been reported that in some doors carbon disintegration is the primary cause of destruction of the lining. In many doors, it is probable that the two forces, working hand-in-hand, cause the lining to wear out much sooner than it would if either force were eliminated.

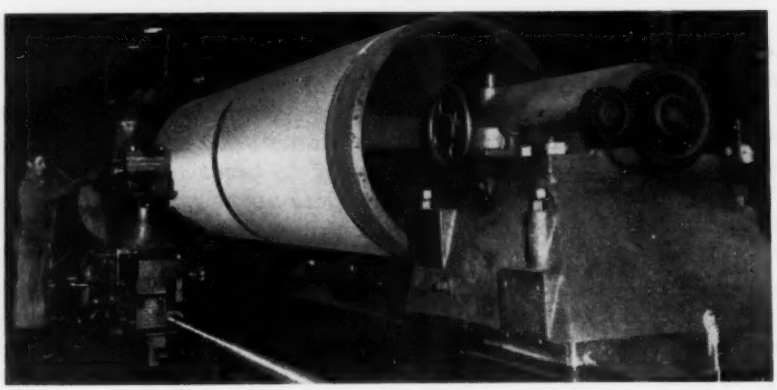
Jamb blocks must withstand a hard-to-resist combination of abrasion and thermal shock within a temperature range of about 1830 to 2730° F. In some ovens, this combination is made even more serious by a load of 15 to 20 psi.

The combustion flue brick in some designs must withstand considerable load at temperatures between 1830 and 2730° F. Lower bench walls must resist load as high as 18 to 20 psi, but the top temperature is only about 1830° F.

In the corbels of the checker chambers, load may be as high as 25 psi, and temperature range about 1830 to 2550° F. Chief requirements of checker brick are high heat capacity and rate of heat transfer, plus ability to retain their size and shape between 1830 and 2730° F. Curtain walls need only resist temperature and temperature changes. The inside curtain walls operate between 1830 and 2550° F, and the outer curtain walls range from 390 to 1830° F.

Brick in the top mat may be subject to a slight load in some designs, but temperature does not exceed about 1830° F. In the foundation mat, load is important in all designs and may reach 30 psi in some, but temperature is never above 1830° F. In main flues, load may reach 20 psi but temperature does not exceed 1400° F.

(To be continued)



REALLY IN THE GROOVE: Made of a solid one-piece steel casting is this giant hoist drum shown having its grooves turned at Cleveland Crane & Engineering Co., Wickliffe, O. Drum is 15 feet long, 48 inches in diameter and weighs 22,300 pounds. When installed on a Cleveland crane in a power house, it will lift 200-ton loads

Details Inhibitive Paints

LATEST type corrosion inhibitive paint formulations for the protection of iron and steel exposed to marine conditions are described in Red Lead Technical Letter No. 4, published by the Lead Industries Association, New York. Complete detailed formulations of high performance synthetic vehicle paints are presented for marine atmospheres, intermittent salt water immersion and continuous salt water submersion.

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Fits Bearings Precisely

Radial play problem, long an industry bugaboo, solved by new inspection instrument

CHALLENGE of producing assembled precision ball bearings to specified standards of radial play, long a difficult and expensive problem in the bearing industry, has been met in the development of an instrument by Sheffield Corp., Dayton, O. The air-operated device will determine before assembly exactly how much space will be left between inner and outer races for the balls.

Of extreme importance in the assembly of the finished product is the precise size as related to the ball diameter and the outer and inner races. The diameter of the inner race plus two ball diameters must very nearly equal the outer race diameter or the bearing will have too little or too much radial play.

Controls Play — Called the Selectionaire, the instrument matches races and balls for bearing assemblies and automatically controls radial play to any desired tolerance.

Common industry practice has been to accurately classify balls and inner and outer races in 0.0001-inch steps, and maintain a stock with many classifications of each of the three components until they can be brought together for assembly. Assuming that inspection of the balls and races is perfect or 100 per cent accurate, it is still possible that the accumulation of allowable variations will result in an error amounting up to 0.0004-inch or more in the assembled bearing.

The bearing inspection instrument is a process gage as well as an inspection instrument. With it classification errors and their accumulation are avoided, the company reports. Use may be in any of the following ways: 1. As a matching gage whereby inners and outers of nominal sizes, but unclassified as to actual deviation, are taken at random. Reading on the gage indicates correct ball size which will give an assembly of predetermined radial play. 2. For selection of inner races to an outer race of known dimension or vice versa. 3. If the assembling process calls for selecting races to match a standard size ball, the inner races are first segregated by classification.

Aids in Selection—An inner race of known size is then used, to which the unknown outer race is compared; resultant reading indicates actual inner race that should be used for the particular outer race and standard size ball to make up the assembly. With the use of the instrument, it is said that bearing manufacturers will be able to meet customer demands for accuracy and specified amount of radial play and at a substantial reduction in cost. Finished inventory and work in process can be materially reduced. With this cost cutting method of assembly of balls and races, the operator may determine in advance or forecast any radial play tolerance.

If present policy is to restrict the number of ball sizes, the maximum radial clearance precision is obtained by selection of matching races. However, if manufacturing emphasis is placed on limiting the number of ball race sizes, it permits quick selection of multisize precision balls to match. Assembly time is reduced and teardown and rebuilding to obtain desired quality are practically eliminated with the introduction of the new gage to the inspection and production line.

Steel Cylinders Heat Treated 100% Faster

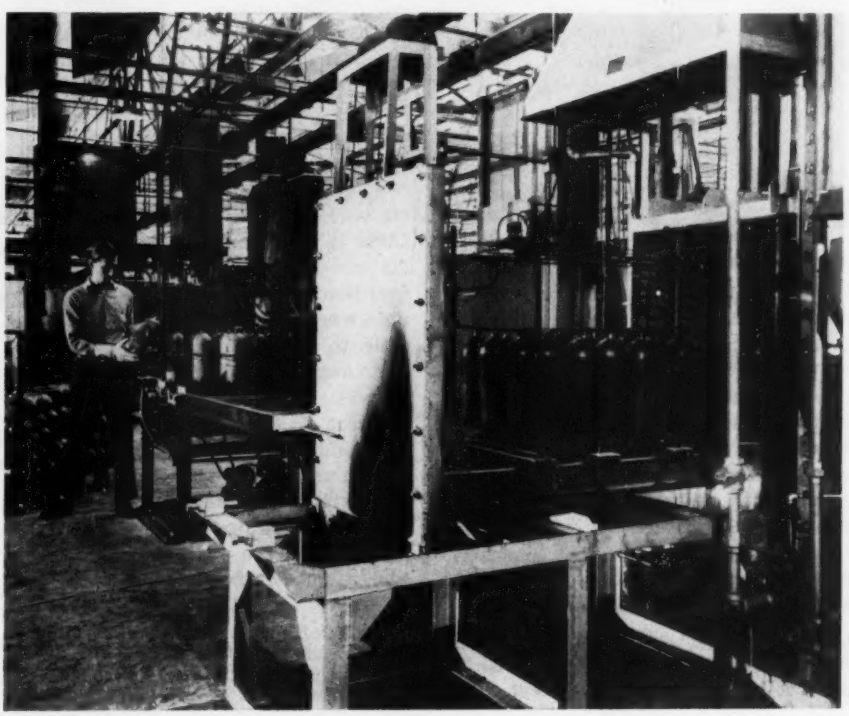
HEAT treating of commercial steel cylinders is speeded up as much as 100 per cent and surface quality greatly improved by a new lithium vapor furnace installed at the Belleville, N. J., plant of Walter Kidde & Co. Inc. The heat treating unit, occupying 800 square feet of floor space, is one of the largest automatic furnaces in the world combining hardening, quenching, degreasing, drawing and cooling operations. It also provides for a normalizing cycle.

One-Man Operation—One man can operate the fully automatic furnace from one location, through a panel of pushbuttons. The only manual operations required are loading cylinders into specially constructed heat-resisting alloy trays. Trays carry the cylinders upright through the furnace on conveyors and elevators.

Designed and installed by Lithium Co., Newark, N. J., the furnace has its own gas cracker to generate either the inert atmosphere employed to prevent scaling of the cold drawn, lightweight steel cylinders, or an atmosphere for carbon restoration. By excluding oxygen from the atmosphere within the furnace, the inert lithium vapor eliminates scaling troubles and gives a rust-inhibiting surface which is superior for subsequent paint bonding.

Kidde produces commercial cylinders in sizes up to 850 cubic inch water capacity. They are used as containers for compressed gases in portable fire extinguishers, carbonated beverage vending machines, medical gas dispensers, freon refrigeration and many other industrial applications.

Cylinders loaded by operator move automatically in trays on roller conveyor into furnace entrance, foreground. Once in furnace, they travel through hardening, quenching, degreasing and cooling processes, returning to starting point



Electronic Controls Can Be Profitable

American Iron & Steel Institute members told electronics will pay off in difficult tasks or where overall cost for doing same job is less. Developments in raw materials and operations, inspection and shipping aired in technical sessions

BECAUSE electronics opened many doors during the war, many people labored under the impression that the era of the pushbutton was here—where a steel mill operator touched the button and electronics did the rest. Although this is not the case, there is a definite place for electronics in the industry, Richard W. Barnitz, Jones & Laughlin Steel Corp., told members of the Iron & Steel Institute at its 58th general meeting in New York, May 24 and 25.

Mr. Barnitz was among the 12 steel industry authorities who reviewed developments on raw materials and operations, electronic controls, testing and inspection and shipping problems during technical sessions at the Waldorf-Astoria Hotel.

Electronics, he said, will pay off if used in tasks previously difficult, where superior response, speed or sensitivity is required or where overall cost for doing the same job is less.

Phototube Best Known—The Pittsburgh engineer pointed out that electronic equipment has been available for industrial use for the past 20 years. The phototube is perhaps the best known, as well as the most publicized, of the electronic tubes. In the boiler house, the phototube measures stack smoke density. These data enable the operator to maintain proper combustion control. In the steel works, the phototube is used on the bessemer converter. In this application, it is focused on the flame through filters and indicates the temperature and condition of the steel during the heat. It also accurately indicates the end point of the heat. In the tin mill, the phototube is utilized as a switch in conjunction with a sheet counter, and as a pinhole detector for eliminating defective sheets.

Controls Steel Strip Flow—Besides its use as a switch, the phototube is used to control the flow of steel strip through the processing lines. It is desirable, at times, to have loops form ahead of and back of trimmers and shears. The amount of this loop can be controlled by a phototube. It is also desirable to control the winding of the coil on the tension reel so that the edges are even. Both of these operations can be controlled by phototube electronic circuits.

The mechanical contact type of steel gage does not lend itself to the continuous high accuracy the trade demands on the high speed tandem cold reducing mill or on other high speed mills. On hot mills also, the temperature of the steel requires the noncontact type gage, unless this gage is located far down the cooling tables from the last stand on the mill. It is, therefore, possible to run through several tons of off gage steel before the finishing stand screwdowns could be corrected by the mill operators.

Measures Steel Thickness — With this hot mill service in mind, the electrical manufacturing companies developed an x-ray gage for the measurement of steel thickness. With advent of high speed cold mills, this gage has been redesigned for cold mill rolling service.

Electronic control as a voltage or speed regulator can be made adjustable over a high range of response and is used to regulate speed on wire drawing machines.

Electronics Promising — There are several other electronic applications on wire drawing machines. One of these is an automatic electronic stop. As one operator has charge of several machines, he is not always available when the spool is full. It is possible to put an electronic switch on the machine to make an automatic stop on full spool.

There is a definite place in the steel industry for electronic controls, but in many applications, due to its high initial or high maintenance costs, rotating or static electrical controls should be installed. However, electronic controls should definitely be used:

1. Where it is operated in such a manner for which no other equipment is available.
2. Where its superior response, speed or sensitivity is required over that of other equipment.
3. Where the overall cost for doing the same job is less.

Future of Power Electronics

ELECTRONICS can be used for converting alternating current power to direct current, and for converting ac power from one frequency into another. During the last 10 or 12 years more than 100,000 kilowatts of rectifiers have been installed in the steel industry to supply 250 volt dc power. About 90 per cent of that capacity has been provided in pumped units of 1000 kw and 1500 kw capacity. The rectifier has now fully proved its worth, according to L. A. Umansky, assistant manager, Industrial Engineering Divisions, General Electric Co., and is presentlyl considered the industry's first choice for this service. It processes a number of advantages over the motor-generator:

1. A rectifier is a static device, better suited for an unattended station than rotating machinery.
2. The rectifier efficiency is higher, particularly at part load. This results in substantial annual power savings. For instance, a 1000 kw, 250 v rectifier energized for 7000 hours a year will probably save some 250,000 kw-hours in that period.
3. The maintenance expense is lower, since there are no bearings, commutators and brushes to maintain.
4. No foundation is needed, therefore, installation costs are lower.
5. Rectifiers do not increase the short circuit capacity on alternating current systems, as synchronous motors do. This might permit, in some cases, the use of smaller circuit breakers.

No Loss of Vacuum—The electrical industry is now ready to supply similarly built large metal enclosed units, of 1000 and 1500 kw ratings, with "pumpless" rectifier tanks, evacuated at the manufacturer's plant and sealed off. One 1000 kw unit of this type has been successfully operating at a steel mill for over 1½ years, without any loss of vacuum. If, for any reason, any one tank will lose its vacuum, it is a simple matter to replace it with a spare, and recondition the defective tank either at the site or by the manufacturer.

It is possible to use power electronic equipment to interconnect two power systems of different frequency, such as 25 and 60 cycle, and to cause

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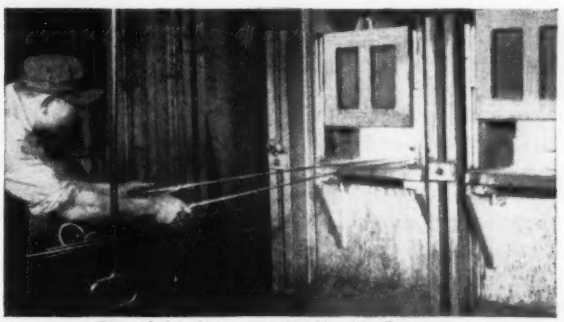
Not One Cent for Maintenance IN 14 YEARS OF SERVICE

Circular Saw Hardening Furnace after 14 years of service—center door partly open.

THAT'S THE RECORD of B&W Insulating Firebrick in Henry Disston and Sons, Inc. circular saw hardening furnace. During 14 years, this furnace handled hundreds of tons of high grade steel. *Despite this grueling punishment, the original walls and roof of B&W Insulating Firebrick are still giving excellent service.*

B&W IFB not only made possible continuously high production, but also assured better quality control . . . due to the quick response of this brick to temperature changes. And because B&W IFB have such a very high insulating value, the fuel savings over the 14 year period were appreciable.

Performance pays off. As a result of this performance, Disston has since lined ten more furnaces of different types with B&W IFB. If you, too, want to increase furnace operating efficiency and lower production costs, discuss your refractory problems with your local B&W representative.



One of the three new Bar Heating Furnaces.

New Bar Heating Furnace under construction with B&W Refractories.

Furnace Specifications

Span of arch 13 ft. consisting of 9 in. K-26 IFB

Length of furnace 15 ft. 6 in.

Height of furnace from hearth to top of arch 2 ft. 6 in.

Side walls and doors 9 in. K-26 IFB

B&W

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

R-367

B&W REFRACTORIES PRODUCTS — B&W 80 Firebrick • B&W Junior Firebrick • B&W 80 Glass Tank Blocks • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS — Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

. . . . *presented paper jointly on "Materials Handling in the Steel Industry"*

W. N. FLANAGAN W. G. NICHOL

Carnegie-Illinois Steel Corp.

power to flow from either system to another.

Two Power Source Efficient—For most efficient operation it is often necessary to tie together the two sources of power and to switch the mill load either to one source or the other, as conditions might require. A frequency changer is essential for this purpose.

It is reasonable to expect that the rectifiers will become increasingly popular to provide 250 volt service in steel mills. In fact, they will become the industry's standard. The pumpless rectifiers of 1000 kw and 1500 kw capacity will enhance their status still further.

The rectifiers will likewise become more popular as the power supply for direct current motor driven nonreversing hot rolling mills. While they are still in a minority as compared with the motor-generators, it is safe to assume that in another ten years or so they will be at least on par with the rotating power converters in this particular field.

Electronics for Mill Drives

A LARGE number of applications of electronic devices have been made in the field of main and auxiliary drive control. One of the most interesting of these, W. R. Harris, manager, metal working section, Industry Engineering Department, Westinghouse Electric Corp., pointed out, is a fast-response speed regulator designed to minimize the transient speed changes that occur when the metal enters the rolls of individually driven rod mill stands.

The modern, high speed electrolytic tin plating line probably utilizes more different types of electronic apparatus than any other single application in the steel industry. Such lines may have the following electronic control and power devices:

1—A plating current-speed regulator to assure proper coating of tin is applied to the strip at all line speeds.

2—High frequency induction heating to reflow tin.

3—Photoelectric scanner system to control the flow line.

4—Photoelectric loop regulators. Depending on the layout of the line several of these may be used.

Coating Uniformity Determined by Controls—If a uniform coating of tin is to be deposited, it is necessary to control the plating current proportional to speed, as it is impossible to operate these lines at constant speed at all times. This is accomplished by an electronic regulator which compares the totalized plating current with the speed of the line. The regulator automatically adjusts the plating power supply to maintain the plating current proportional to the line speed.

One of the outstanding wartime accomplishments of radio frequency heating was its use to reflow the tin on electrolytic tinning lines. The tin plate produced on an electrolytic line has a gray matte surface. If the tin is heated to the flow point, the strip surface changes from a matte to a bright, shiny appearance and results in a coating which has minimum porosity, maximum corrosion resistance and which is better bonded to the steel strip.

In order to assure proper reflow of the tin coating at all line speeds and with varying widths and thicknesses of strip, a unique electronic photoelectric scanner system was developed.

Varies Line Speeds—The action is such as to automatically maintain the flow line between the two sets of photoelectric scanners. With this system, it is possible to vary the tinning line speeds over a range of from 50 to 1300 feet per minute and to properly flow all of the strip passing through the inductor coils. This is an application which would have been extremely difficult, if not impossible, without the use of electronic control means.

Probably one of the best known and more common uses of photoelectric devices in the steel industry is the system designed to keep the loop between the two phototrollers. If the loop gets above unit 1, the motor driving the pinch rolls will be slowed down by relay action. If the loop falls below unit 2, the motor will be speeded up by relay action. The phototroller consists of a phototube and an amplifier to furnish power to operate the relay equipment.

An understanding and an acceptance of electronics is growing and the future holds considerable promise of broader utilization. For example, the recently developed x-ray gages are just now coming into general use as measurement devices, and there is good possibility that they may be used in the future for automatic control or regulating functions.

The Electronic Microscope

MANY organizations engaged in the study of metals are using electron microscopes. When electrons are reflected from the surface of a compact object they exhibit great variation in velocity since most of them undergo considerable energy losses before they are scattered back out of the surface. Although arrangements have been effected whereby images have been obtained, in one case these images were very faint and inferior to those of a good light microscope and in another they were very badly distorted. When thin replicas of surfaces are used, good images can be obtained, A. L. Ellis, manufacturing research, International Harvester Co., pointed out.

Technique Slow — Preliminary studies indicated that statistically reliable results could be obtained, but the technique first used was slow and work is now in progress which will reduce the time per determination.

It is possible that under favorable circumstances the electron microscope method may have some advantages over the x-ray diffraction method for quantitative determination of austenite in so far as time is concerned.

Good Reliability Indicated — The good agreement between the electron microscope and x-ray diffraction in so far as austenite was concerned indicated that we now had a fairly reliable basis for interpretation of the microstructure. Since, we could dis-

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tinguish between the austenite, martensite and carbide phases, with this degree of accuracy, we could feel more confident about what we were looking for.

Raw Material Sources

IN VIEW of numerous articles dealing with sources of raw materials for the steel industry, it is felt that we as an industry must correct any gloomy sensationalism of articles wherein our reserves are referred to in terms such as "imminent exhaustion" or "bottom of the barrel."

There is no pat answer, no campaign slogan reply, to the raw material question, according to C. C. Henning, general manager of raw materials, Jones & Laughlin Steel Corp. and R. W. Braund, assistant general superintendent Jones & Laughlin Ore Co., Ishpeming, Mich.

Limestone, he said, including dolomite, occurs in tremendous quantities in almost all parts of the United State.

Future Supply Sources—The Michigan area should continue to ship in the future as it has in the past. If prices justified underground mining, additional reserves would become available. For the Pittsburgh, Youngstown and Ohio Valley districts three are very large reserves. Exhaustion of known deposits and increasing land values are, however, making it more difficult to maintain these reserves. In the South and West present sources should provide quality stone for years to come.

Coal Reserves—Various authorities in recent years have discussed the factors entering into the estimating of coal reserves. It is possible to cite published figures that vary quite widely in their totals. Some of the more recent estimates use a figure of 457 billion net tons of bituminous coal for the important eastern provinces (Pennsylvania to Alabama). It has also been stated that at least 10 per cent of all known reserves of bitumious coal east of the Rocky Mountains could be utilized as coking coals by the application of processes in use. Better mixing or blending of presently available coals has been producing coke of improved and more consistent quality. Extensive studies are being carried on in an effort to evaluate the suitability of coals not widely used at present. In a great many cases these studies have led to decisions to purchase certain coal lands with a resulting substantial increase in coking coal reserves.

Ore 50 Years Hence?—Many published articles stated that the industry is faced with a shortage of readily available ore, that within a measurable period of time it will be unable to supply present plants with iron ore. However, in the light of rapid advances in science and other changing conditions it is felt that it is somewhat unrealistic to expect the steel industry to know specifically today exactly where its ore is coming from 25 or 50 years from now. Our problem is not that of a shortage of iron ore, but rather the necessity of deciding just which source or sources it will be most advantageous to develop.

Numerous papers have in their various ways raised our hopes or cast us into a state of gloom over the matter of taconites. It is felt that considerable optimism is warranted in this field since the basic process of producing high grade concentrates from magnetic taconite has been proved. The operations of Republic Steel Corp., and Jones & Laughlin Steel Corp., in the Adirondacks are an indication of what can be done in concentrating lean ores on a large scale. Operating techniques developed will inevitably become available for rapid and economical expansion of the industry.

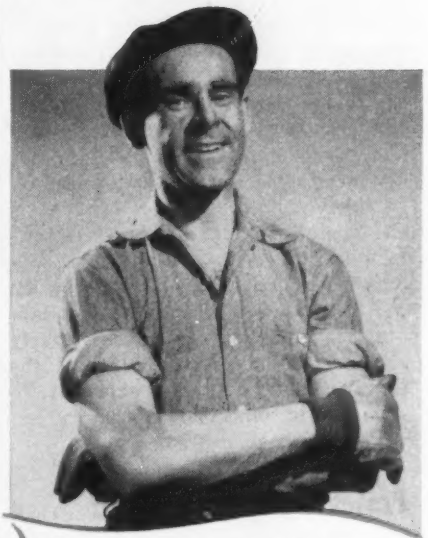
DELAYED ACTION

Final installment of "Production of Malleable Castings", in the Fundamentals in Steelmaking series—originally scheduled for this space—will appear in the issue date June 5.

Use of the Spectroscope

PRESENT steelmaking practices, according to E. O. Waltz, chief chemist, Canton Steel Division, Republic Steel Corp., have only served to increase the "bottle - necking" effect of the chemical laboratory. Industry thus supplied the need and the incentive for the development of spectroscopic methods of analysis.

Saves Laboratory Time — Average



"Who said Clancy lowered the boom?"

"He didn't—because the boom broke! And I was on the gang in the Levinson shop that fixed it."

We got the call from Jones & Laughlin Steel Corporation at 4 p.m. on a Friday not long ago, just thirty minutes before the week-end shut-down. Immediate arrangements were made for shear-men, crane-men, welders, warehousemen and so on, who worked continuously Saturday and Sunday. *And the boom was back in service ready to use* when the first shift reported Monday morning.

Yes, that's another idea of the way we interpret the word SERVICE in our organization!

On Hand Always:

THE MATERIAL . . . THE FACILITIES . . . THE DETERMINATION . . . THE "KNOW-HOW" . . . TO DO YOUR JOB HOW YOU WANT IT WHEN YOU WANT IT.

The Levinson STEEL COMPANY

PITTSBURGH, PA.

LS-4

savings in man-hours of laboratory work per test is more of the order of 0.5 man-hours when we consider that some tests require only carbon and manganese, or possibly manganese only, rather than a complete analysis. Two preliminary tests and two taken during teeming does not appear to be an expanded figure, yet only four tests per heat at a savings of 0.5 man-hours of laboratory work per test, results in a savings of two hours of laboratory work per heat melted. A man-hour of laboratory work may be conservatively stated in money at $2.50; thus, the spectrograph may be expected to save $5 in chemical laboratory expense per heat melted.

Protecting Steel in Transit

AT PRESENT, steel products are shipped from the mill by both railroad and truck. Each has its advantage according to A. H. Andrews, special engineer, Bethlehem Steel Co. For example, no weather protection is required for the short haul by truck. The trucker furnishes chains to secure the load and a tarpaulin to keep out the weather. This relieves the mill of some expense in "blocking" lumber, paper, and labor of attachment.

Too Much Shifting—The arrangement for loading trucks is not always the best at a mill which was designed for railroad transportation. The processing units may discharge into the warehouse building at several points with the result that movement by truck requires shifting within the warehouse beyond that which would be required in the case of railroad shipments.

The closed van truck will carry the same group of steel products as the closed car. It is loaded with a fork lift truck as easily as a boxcar (perhaps more so) and affords equal weather protection.

Open Top Shipments Popular—The ease of handling large units of sheets with the overhead crane makes open top shipments popular with both producer and consumer so equipped. The wrapped pack is loaded with a pack lifter designed for the job. The shroud is applied in the car and is made of heavy, waterproof paper of premium quality. It serves as a substitute for the roof of a boxcar.

Shipments by truck and water are not subjected to sudden shocks in the direction of travel. It is inherent with these methods of transportation that the units in the shipment remain where originally located. The blocking and tie down devices must be sufficiently strong and tightly applied to prevent movement, yet so designed that the products will not be damaged under the constant pressure.

Relation of weight to distance has practical application in commercial shipments. When a car is packed with numerous light lifts, there may be insufficient room at the ends of the car to accommodate the movement expected. The logical step is to combine the many small units into a few large units which will move less. The combination reduces the amount of floor area occupied by the shipping units, provides more space for movement, and reduces the distance the unit will shift under a given impact.

Truck, Barge Shipping Problems

FOR MANY years substantially all freight moving between points in the United States was transported by the railroads. Canals and rivers have and continue to account for a rather substantial tonnage of such commodities as coal, sand, gravel, scrap, pig iron, and iron and steel products, and lesser tonnages of stone, slag, etc. It is estimated that the railroads are hauling not more than 70 per cent of all steel products; 25 per cent is moved by truck, three per cent by inland waterways, and two per cent on coastal and intercoastal routes.

Rates Create Truck Demand—The wide difference between rail and truck rates, particularly as applied to service between major steel producing points and large markets which are in the zone of short haul operations, as well as the additional cost of loading onto and unloading from railroad cars as compared with motor trucks, has caused the receivers of steel to substantially increase the demand for truck delivery H. D. Rhodehouse, general traffic manager, Republic Steel Corp., told AISI members.

The trend to truck transportation, he said, has been accelerated by the ability of trucks to offer and perform relatively fast and direct movement from point of origin to destination. Many difficult problems are encountered in making barge shipments that are not involved in connection with rail or truck movements. Each shipment by barge is more or less a special movement and necessitates careful investigation and planning before the actual shipment can take place.

Move Timing Important—Two or three separate movements are involved as against one direct movement when shipping via rail or truck.

Within the last few months, railroads east of the Mississippi river have made a thorough study of truck competition. Because of the heavy tonnages of certain steel products which are moving by truck, particularly in official territory, the railroads reduced their rates on certain manufactured iron and steel articles, minimum 80,000 pounds per car, to meet truck competition. Railroads in official territory expect to regain much of the tonnage now moving by truck.

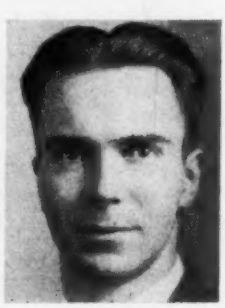
Plan Lower Freight Rates—Railroads in Southern territory are planning to make a general reduction in steel rates to recapture some of the tonnage already lost to trucks and particularly to avoid further diversion of steel shipments from rail to truck.

Trucking companies which transport iron and steel articles in heavy volume in these territories, are giving further study to this problem, and for the next few months at least, there will be much confusion in determining the most economical method for transporting steel articles.

Packaging Tin Plate

PACKAGING methods selected by the manufacturer often influence the requirements of the consumer with resulting economies to both, D. H.

G. H. TODD
Armco Steel Corp.



W. M. MURRAY
M.I.T.

. . . . presented papers on "The Handling and Storage of Refractories" and "Some Experimental Techniques in Stress Analysis", respectively

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Dellinger, head of service and inspection, Weirton Steel Co., told institute members. The packaging of tin plate is a particularly good example. In order to utilize automatic piling, platform skids are now made as near to but under the actual sheet size to be packaged. Solid surface decks are recommended for all tin coated products but the use of skeleton or slotted deck skids has been approved for certain special uses when specified by the consumer.

Cartons Recommended—We have at all times advocated the use of the corrugated fiber carton which has had widely favorable acceptance by consumers and general use by the majority of producers. The corrugated carton provides a cushion for the handling of units and helps resist damage, while an adequate waterproof paper inner wrap provides resistant to moisture penetration. Such a package is not designed for the rough handling of dockside loading which export shipments must take but has been found suitable for the ordinary handling of truck, barge and rail shipments.

The basic and most important part of the securement in our package is the vertical corner angles and horizontal tie which secures these four angles. They are placed over the paper wrapping of a paper lined unit. It is imperative that a piece of corrugated fiber board or chip board be placed under each angle to cushion it and prevent damaged corners.

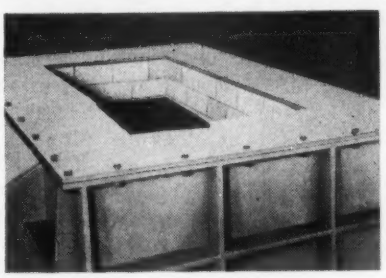
Play Dual Role—The angles and the belly tie have a dual benefit in that they prevent shifting of the sheets by holding the unit in a solid block and also give physical protection to the corners. Ordinary cold rolled sheet stock between 0.035 and 0.050 gage is used for 2 x 2-inch corner angles. Using ¾-inch by 0.028 gage band, one horizontal tie applied at the midpoint is adequate.

After the carton is on the unit, two ties each way are used with full length angles at the bottom and 2 x 2 x 3-inch clips at the top. Bottom angles are 1 x 3-inch applied with the short leg under the skid deck. Domestic platform skids are made with runners 2 inches shorter than deck to make application of angles easy and quick. When no paper lining is used, full length angles are applied only on the ends, and clips used on the side.

GALVANIZING by induction *

Seven ton capacity Ajax Low Frequency Induction Furnace now in use for Hot Dip Galvanizing.

another AJAX First



Showing the heavy refractory brick lining walls containing the molten zinc. No iron kettle is used.

Now Ajax engineers have developed a galvanizing furnace lined with an inert refractory material. The melt is internally heated by the electric induction principle introduced by Ajax more than thirty years ago. Costly iron kettle replacements and dross formation from iron kettle are eliminated. Internal circulation assures complete uniformity of temperature.

FASTER PRODUCTION • UNIFORM QUALITY
LESS MAINTENANCE • LOW OPERATING COST
ABSOLUTE TEMPERATURE CONTROL • LONG
LIFE • REDUCED DROSSING • NO HOT SPOTS
SMALLER ZINC BATH POSSIBLE

AJAX ENGINEERING CORPORATION
TRENTON 7, N. J.

AJAX TAMA-WYATT INDUCTION MELTING FURNACE

Associate Companies: AJAX METAL COMPANY, Non Ferrous Ingot Metals and Alloys for Foundry Use
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax-Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

Machining, Drawing Fluids

(*Continued from Page* 62)

paratory to the drawing process.

General practice, for low alloy and carbon steel tubes and bars, is to immerse the work in an emulsion of about 15 to 20 per cent soap-fat concentration. This emulsion or "dope" is maintained at 120 to 140° F. Prior to this immersion, the tubes or bars may have been either Bonderized in a phosphate solution or copper coated in a copper sulphate solution. The purpose of either of these treatments is to facilitate the drawing.

After immersion in the "dope" tank the tubes or bars are air-dried to set up a hard coat. Some types of high carbon tubes may be also lime coated before drawing.

Special Pretreatment — Stainless steel tubes are given special treatment preparatory to drawing. Either pretreatment of the metal surface is made in order to allow the use of conventional tube drawing "dopes", or (2) special adhesives, such as lithopone-shellac are applied to the tube, or (3) it is lead coated. New types of chemically active drawing oils at present look promising for stainless steel tube drawing. Chief among these are the heavy viscosity chlorinated oils.

Aluminum tubes and bars are drawn with heavy compounded oils either swab applied at the bench or circulated over the die and through the mandrel, as in the case of tube drawing. Fatty oils and soaps are the usual compounding, varying from 10 to 30 per cent dependent upon the alloy of metal drawn, size, speed, and reduction to be obtained. The softer metals require more compounding to minimize metal pickup on dies and plug. Sometimes heavy residual asphaltic black oils (SSU 400 at 210° F) are found satisfactory for aluminum tube drawing. However, these are hard to clean and may have other operating disadvantages as well.

Copper and brass tubes and bars may be drawn with either heavy viscosity (SSU 150 at 210°F) compounded mineral oils or with soap-fat emulsions of about 15-20 per cent solids concentration. Even leaner emulsions may be used, down to about 10 per cent concentration, dependent upon the alloy and conditions of drawing.

Cupro-nickel, bronzes, and some brasses are preferably drawn with an emulsion containing some pigment filler (about 1-2 per cent in the emulsion) to avoid chatter and give better finished tubes.

Rod and Wire Drawing—Two methods of wire drawing are the "dry-draw" and the "wet-wire" method. The former employs dry soap powder, lime, or grease in a lubricant box positioned ahead of the drawing die. This die may be water cooled by suitable apertures in the die block and a piping arrangement to a circulating water system. However, the drawing lubricant itself is "dry".

The wet-wire method uses an aqueous solution, emulsion, or an oil fluid circulated over the wire and dies in an enclosed machine. Whereas dry drawing may be in either a single block or a series of tandem die blocks, the wet-wire method is always used in drawing through a series of lubricant flooded dies. This is known as continuous drawing and is always used for finish drawing fine wire in both the ferrous and nonferrous wire industries.

Heavy ferrous wire is almost always drawn "dry" using soap powder, lime or grease.

Fine steel wire drawn by wet-wire methods uses a soap-fat emulsion of about 1.5 to 2.5 per cent solids concentration. This emulsion is made up in the plant from soap-fat paste type compounds.

Stainless Wire—Stainless steel wire may be drawn by either emulsions of similar type or by the use of chemically compounded drawing oils. These oils, if very viscous, may be used in block drawing like a grease, or if sufficiently fluid to circulate, may be used in continuous wet-wire machines.

Aluminum wire is best drawn by oils, usually compounded with fatty oils and soaps. Viscosities of oil used vary with the size wire drawn. Heavy rod (⅜-inch diameter) down to intermediate sizes are drawn with various heavily compounded oils of SSU 1000 to 2500 at 100°F viscosity. Such oils can be circulated at bulk temperatures of 120 to 150°F in continuous type machines. Intermediate wire is drawn with lighter compounded oils, and fine wire with SSU 100 at 100°F compounded oils in high speed continuous machines.

Copper and Brass Wire — Copper and brass wire are drawn entirely by the wet-wire method. Copper rod is drawn with emulsions of 5 to 6 per cent soap-fat solids concentration at speeds up to 4000 fpm. Bulk temperature of the emulsion is usually held at 140 to 160°F.

Intermediate size wire (B.&S. gages No. 14 down to No. 28 or No. 30) is drawn at speeds up to 5000 fpm using about 3 per cent soap-fat solids concentration in the circulating emulsion and bulk temperature of 120 to 140°F.

Fine size wire (below about No. 30 B.&S. gage) is drawn at speeds of 3000 to 4000 fpm in continuous machines using a very dilute circulating emulsion (about 1 per cent soap solution or leaner) at a bulk temperature of 100 to 110°F.

Both the composition and concentration of soap-fat emulsions in copper wire drawing machines must be very carefully made up and maintained to assure the right results. Too high a free fatty acid will cause excessive formation of green copper soaps which are insoluble and appear as a bright green scummy deposit inside the system and around dies. Such soaps in excess can cause clogging of dies, die wear, and other difficulties.

"Sticky" Wire—Too much fat in relation to soap in fine wire drawing can cause "sticky" wire, wrapping.

TABLE II

DRAWING OIL AND COMPOUND RECOMMENDATIONS

Drawing Operation	Carbon Steel	Alloy Steel	Stainless Steel	Aluminum	Copper and Brass	Bronze Alloys
Fine Wire Draw	E 24	E 24	D	B	E 40	E 40
Intermediate Wire	E 24	E 24	D	B	E 24	E 24
Rod Breakdown	G	G	D	B	E 12	E 12
Bar Draw	F 4	F 4	D, J	B	F 6	F 6
Tube Draw	F 6	F 6	D, J	B	E 6	F 6
Blanking and Stamping	A, E 6	B, E 6	D	E 6	A, E 6	F 6
Shallow Press Drawing	E 4	F 4	D	E 4	B, E 4	F 4
Deep Draw (Cold)	E 2	F 1	D	C, E 3	C, E 3	F 3
Deep Draw (Hot)	..	..	..	H*	..	..
Heavy Cupping	F 2	F 2	D	C, E 2	F 2	F 2

Legend

Types of Drawing Lubricant Recommended

A—Drawing Oil—Straight Mineral S.S.U. 100 to 300 @ 100° F.
B—Drawing Oil—Mineral—Fatty Oil Blend
C—Drawing Oil—Straight Fatty Oil
D—Drawing Oil—Sulphurized or Chlorinated Oil
E—Emulsion—Soap-fat Compound (Note 1)
F—Emulsion—Pigmented Soap—Fat Compound (Note 1)
G—Solid—Dry Soap, (Sodium), or Combination with Dry Lime
H—Solid—Graphite in light vehicle (either petroleum or aqueous)
J —Solid—Soft metal (such as lead coating)
* —Also applicable for Hot Draw of Magnesium

Note 1—Suffix number following recommendation indicates water dilution to be used. Thus: E 4 is a mixture of 1 part compound to 4 parts of water for use.

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and wire breakage. Too much soap in the solution, or too high a concentration in the system can cause foaming. This is particularly a problem in high speed drawing of fine wire. Bulk temperatures of systems must also be controlled to meet the particular needs of the system.

For applications of drawing fluids and lubricants refer to Table II. This shows recommended types of fluids and identification of these by description.

Machine Tool Standards

TWO new and two revised American standards for machine tools, covering punch and die sets for two-post punch press tools; involute serrations, single-point tools and tool posts; and twist drills with straight and taper shanks, have been approved, according to American Standards Association, New York. Standard for punch and die sets for two-post, punch press tools covers design and dimensions of back-post sets and diagonal-post sets which are in general demand by tool designers and which are used by die makers for the mounting of punch-press tool details.

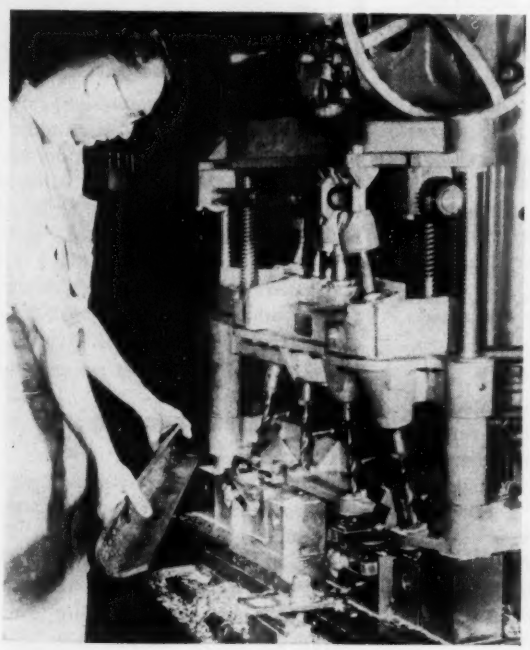
The involute serrations standard was prepared to replace the SAE serrated shaft standard; it provides a uniform, easily fabricated set of serrations that can be made by several manufacturing processes. Range of teeth provides diameters both smaller and larger than the old standard, with the result that there is a much greater selection of sizes.

Three new sections on standard types of single-point tools, in addition to standard terminology, definitions, and sizes of tools and tool holders contained in earlier standards are in the revised standard on this type of tool. Revised standard for twist drills, straight shank and taper shank, contains four major changes from the 1940 edition. Tolerances set on various features of drills now provide interchangeability of products of different manufacturers in the users' plants. Taper shank drills have been included and the sequence of diameters of straight drills has been changed to correspond to actual sizes purchased and used in the industry.

Educational Motor Drive

AN assist in the teaching of electronic motor control and associated circuits may be provided by a full wave reversing educational "Thy-motrol" drive, being introduced by the educational section of apparatus department, General Electric Co., Schenectady 5, N. Y. Demonstration equipment consists of seven circuit panels and five instrument panels assembled on a steel frame and mounted vertically on a steel table.

Circuit diagrams are molded in white into the front of the dark laminated panels. Actual wiring and all components, excepting the tubes, are behind the panels, with all important circuit points brought to the front of the panel by insulated jacks. Thy-motrol motor, tachometer generator and manually-operated brake are mounted on a common sub-base for separate mounting.



NEW ANGLE ON DRILLING: Specially designed, this fixed center drillhead drills 4⅝-inch holes in alloy steel at angles varying between 4 and 13 degrees on each side of the perpendicular. Built by Thriftmaster Products Corp., Lancaster, Pa., and installed in the La Porte, Ind., plant of Allis-Chalmers Mfg. Co., the part drilled is a component of a forage harvester which is built in production quantities

CALENDAR OF MEETINGS

† Denotes first listing in this column

May 29-June 9, Canadian International Trade Fair: At Toronto, Ont.

June 1-2, American Society for Quality Control: National convention and midwest conference, Milwaukee Auditorium, Milwaukee. Society headquarters are at 4949 W. 65th St., Chicago.

June 1-3, Electric Metal Makers Guild: Meeting, Shawnee Hotel, Springfield, O. Guild address: Box 6026, Mt. Washington Station (11), Pittsburgh.

June 4-9, Society of Automotive Engineers: Summer meeting, at French Lick Springs Hotel, French Lick, Ind. Society headquarters are at 29 W. 39th St., New York 18.

June 5-7, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association headquarters: Empire Bldg., Pittsburgh 22.

June 5-7, Institute of Cooking and Heating Appliance Manufacturers: Annual convention and exhibit, Netherland Plaza Hotel, Cincinnati, O. Headquarters of institute are in Shoreham Hotel, Washington 8, D. C.

June 10, 20th National Business Conference, conducted by Harvard Business School Association, Soldiers Field, Boston.

June 11-14, National Association of Purchasing Agents: Inform-A-Show, Public Auditorium, Cleveland, O. Headquarters of association: 11 Park Place, New York 7.

June 12-15, American Electroplaters' Society: Annual convention and international conference on electrodeposition, Hotel Statler, Boston. Society headquarters address is P. O. Box 168, Jenkintown, Pa.

June 13, Stoker Manufacturers' Association: Annual meeting, LaSalle Hotel, Chicago. Address of association: 307 N. Michigan Ave., Chicago 1.

June 15-17, Material Handling Institute: Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are in the Clark Bldg., Pittsburgh 22.

June 16, Wire Association: West coast regional meeting, Sir Francis Drake Hotel, San Francisco. Association is located at 300 Main St., Stamford, Conn.

June 16-17, American Society for Metals: Seventh biennial Pennsylvania interchapter meeting, State College, Pa. Society headquarters: 7301 Euclid Ave., Cleveland 3.

June 19-23, American Society of Mechanical Engineers: Semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York 18.

†June 21-22, Caster & Floor Truck Manufacturers' Association: Summer meeting, Skytop Lodge, Skytop, Pa. Association offices: 7 W. Madison St., Chicago 2.

†June 22-23, Malleable Founders' Society: Annual meeting, The Homestead, Hot Springs, Va. Society headquarters are in Union Commerce Bldg., Cleveland 14.

†June 26-30, American Society for Testing Materials: Annual meeting and exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Headquarters of society: 1916 Race St., Philadelphia 3.

†June 26-July 21, Product Design Seminar: Lehigh University, Bethlehem, Pa. Sponsored by Lehigh and Society of Industrial Designers, 48 E. 49th St., New York 17.

†July 12-14, American Society of Civil Engineers: Summer convention, Toronto, Ont. Society headquarters are at 33 W. 39th St., New York.

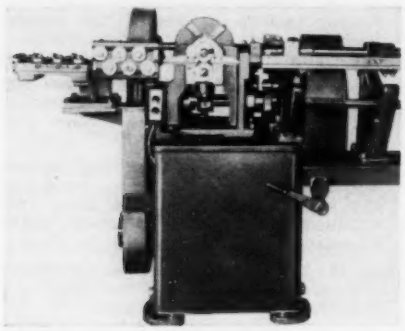
July 12-14, American Home Laundry Manufacturers' Association: Meeting, Atlantic City, N. J.

†July 28, Malleable Founders' Society: Western sectional meeting, Drake Hotel, Chicago. Society headquarters are in the Union Commerce Bldg., Cleveland.

New Products and Equipment

Straightens, Cuts Flat Stock

Twelve straightener rolls, six in each plane, are mounted on needle bearings in the Shuster automatic flat stock straightening and cutting machine, built by Mettler Machine Tool Inc., New Haven, Conn. Instantaneously operating clutch and cutoff cam make the cutoff lever practically a flying shear. The cam is of



steel with working parts hardened. Guide bar cover is operated by a separate cam independently of cutoff lever.

Machine is made in two models: Type 1AF has a capacity of $\frac{1}{16}$ x $\frac{3}{16}$ to $\frac{3}{32}$ x $\frac{3}{8}$-inch flat wire, $\frac{1}{8}$ to $\frac{7}{16}$-inch square or hexagon; capacity of type 2AF machine is $\frac{1}{16}$ x $\frac{1}{4}$ to $\frac{3}{32}$ x $\frac{1}{2}$-inch flat wire, $\frac{3}{16}$ to $\frac{1}{4}$-inch square or hexagon. Feed rolls, which are adjustable toward or away from center of wire, are released at time of cutting by use of lever and cam. Shaft which drives feed and cutoff mechanism operates on ball bearings; flywheel has roller bearings.

Check No. 1 on Reply Card for more Details

Cuts Wet or Dry

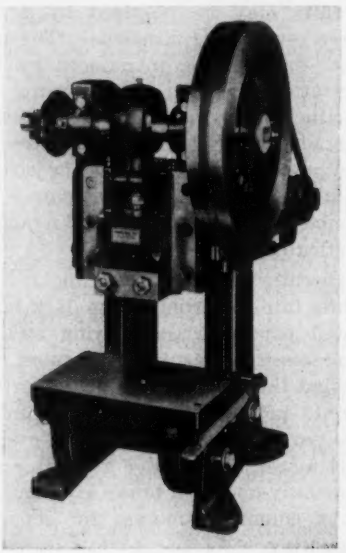
Tabor Mfg. Co., 6225 Tacony St., Philadelphia 35, Pa., is offering 3 hp abrasive cutoff machines for bar stock and shapes which will handle right angle to 45 degree bevel cuts in wet or dry operation. Machines are offered in floor or bench mounted models, both with Timken roller bearing-mounted spindle and trunnion. Capacity is ¾-inch solids, 2-inch by 16 gage or 1½ x $\frac{3}{16}$-inch tubes, formed light sheet up to 2 x 6 inch or equivalent areas.

Power transmission is through two V-belts. Abrasive wheel used is 12 inches in diameter and up to $\frac{3}{16}$-inch thick. Wheel speed is 10,000 fpm. Start and stop buttons actuate automatic starters with overload relays and no-voltage release. Table measures 13 x 28 inches. Coolant is fed to both sides of the wheel at the hub and is then thrown centrifugally at the cut. Length stop is adjustable.

Check No. 2 on Reply Card for more Details

Inclinable Bench Model Press

Featuring a 7 x 10-inch bolster plate which permits use of standard die sets, is an open-back, inclinable bench model press of 4-ton capacity, made by Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22, Calif. It has large hardened and ground adjustable vee-type ram guides on each side of the frame and an over-sized ram area. It is equipped with a one-



piece ground crank shaft with extra heavy connecting rod.

A single trip mechanism, adjustable for wear and instantly convertible from single trip to repeat and back without stopping the motor, is incorporated in the design. Other features include an internal stationary-type adjustable knock out arrangement, a rigidly-constructed frame with extra-wide opening in back to accommodate larger stock when fed from front and a full-size adjustable brake.

Check No. 3 on Reply Card for more Details

Locks Speed Automatically

Rate of speed can easily be changed and set by a simple knob movement on the Fra-Sure variable speed transmissions for fractional horsepower motors, made by Frazier & Son, 338 Cortlandt St., Belleville, N. J. Automatic speed locking device keeps pulley in the desired position throughout the entire 3 to 1 ratio. Units are easily installed.

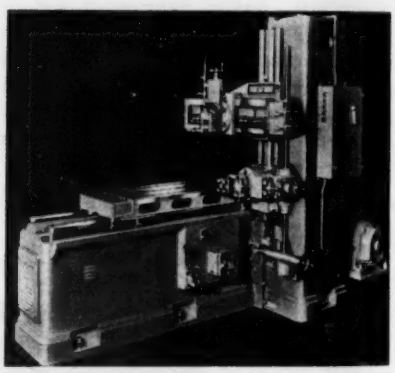
Installation may be in any position on the machine; remote control is available if desired, to be placed in a position best suited for the operator. Operating components consist of a double grooved pulley on a floating type jack-shaft with one groove of the pulley driven by the motor and the other groove driving the machine by two A-section V-belts. Belts, with the aid of springs on both sides of the end faces, control flanges, assure perfect alignment.

Check No. 4 on Reply Card for more Details

Longer Stroke Shapers

Rockford Machine Tool Co., Rockford, Ill., is producing a Hy-Draulic openside planer in additional stroke lengths of 48, 60 and 72 inches. These added lengths allow the machine to accommodate longer shaper and small planer work. With the longer table lengths, the driving motor is mounted to the side of the bed directly behind the column saving floor space.

Work capacity of this line of shapers will accommodate work pieces 24 inches high, 30-inches wide and lengths of 36, 48, 60 and 72 inches. Work table is of box-section,



supported by a double-length bed. Standard cross-rail is manually adjustable but power elevation is offered. A side-head and automatic tool lifter are also extra equipment. Hy-Draulic drive and feeds provide a continuous range of cutting speed and feed changes. The cushion effect of oil pressures increases the life of cutting tools, between grinds.

Check No. 5 on Reply Card for more Details

Speeds Stock Feeding

Operating on punch presses, spot welders and drill presses, etc., is the Feedmaster automatic air stock feed, announced by Great Western Tools Inc., 3811 Riverside Dr., Burbank, Calif. It is designed for feeding coiled or strip stock of almost any size and shape up to 18 inches wide and up to a 12-inch stroke. All movements

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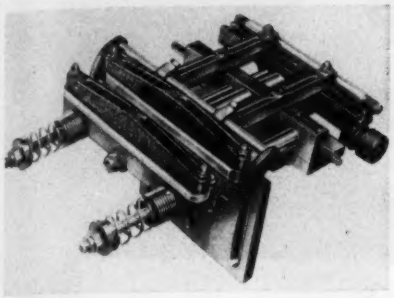
operate pneumatically, an air-actuated feed head pulling the material through the machine and an air-actuated hold head holding the material while the feed head returns to the reload position.

Gripping capacity of the improved speed head is increased by 50 per cent and springs added to the bar supports absorb the shock load. Feeding unit efficiently operates at over



200 strokes per minute with accuracy. It may be used with plain, compound or progressive dies, marked either on the die or to the machine, either side, front or back, push or pull, by means of the provided angle bracket.

Check No. 6 on Reply Card for more Details

Clamp for Various Materials

Naper Clamp Co., Naperville, Ill., is making a mechanical clamp which locks when the clamping bar is brought to rest on the operation in setting. Series of teeth on a cam is turned to mesh with serrations on the locking pose. Clamp locks at any height from $\frac{3}{16}$ to 4 inches. Each succeeding operation is locked by the cam clamp handle. Upon release, a spring opens the clamp $\frac{1}{8}$-inch for easy unloading and reloading.

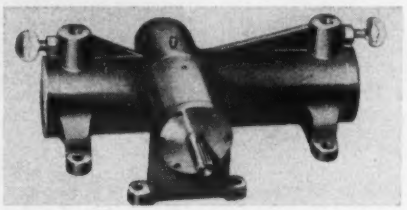
Clamping bar moves in a straight line, eliminating tendency to push the operation away from locating stops. Clamp has a capacity of 4 inches. Clamping bar holds operations securely at any point of contact. In the standard unit, clamping bar measures $\frac{7}{8}$ x 2 x 4 inches.

Check No. 7 on Reply Card for more Details

Motor Multiplies Air Power

Airlok air motors, made by QC Engineering Products Division, Pearson Inc., 2842 W. Grand Blvd., Detroit 2, Mich., convert compressed air through gearing to high torque reciprocating motion of driven shaft. Should air pressure drop or fail completely, all movement in either direction, regardless of load, is stopped. When air supply is resumed, lock is automatically disengaged and normal operation continues.

Through adjustment of two thumb screws, power factor and speed in either or both directions may be instantly secured for a particular application. Power can be transmitted from driven shaft through rack and

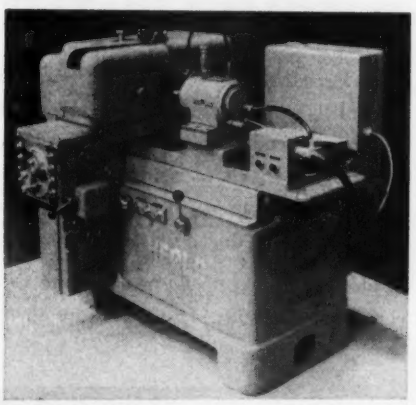


pinion, cam, gears, sprockets and chain, sheaves or other methods, ratios of which afford a wide range of movement member or members. Two types are offered: For flush mounting on casting and for base mounting.

Check No. 8 on Reply Card for more Details

For Multiple Installations

Designed for battery installation which features a central hydraulic system is a model 180 centerless internal grinding machine, offered by Heald Machine Co., Worcester 6,



Mass. Central coolant supply adaptation as well as central power source for optional Hi-Frequency equipment are also available.

Because the machines are completely automatic, several may be tended by a single operator. By operating from a single central hydraulic power unit, these battery type installations offer savings in initial investment, maintenance and operating costs.

Check No. 9 on Reply Card for more Details

Lightweight Conveyor

Adapted to outdoor installations where corrosion is a problem or dusty or hazardous locations where nonsparking equipment must be specified are lightweight aluminum Rapid-Roller gravity conveyors, announced by Rapids-Standard Co. Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich. A locked inner cone with free running, hardened steel ball bearings, prevents rotation of the bearing on the shaft and eliminates binding under loads.

Conveyor is made in 5, 8 and 10-foot sections and 12 and 18-inch widths. Rollers project $\frac{3}{8}$-inch above side channel frame. Choice of four roller spacings is offered. Weight of a 5-foot section of 12-inch width conveyor is 27 pounds; this section is capable of supporting over 1000 pounds. Sections may be connected to other power belt and gravity conveyors made by the company.

Check No. 10 on Reply Card for more Details

Strapper Weighs 15 Pounds

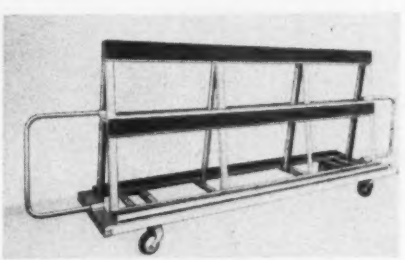
Developed by Signode Steel Strapping Co., Chicago, Ill., is an automatic seal feed tool for $\frac{3}{4}$-inch strapping. The model A-34 tool weighs 15 pounds. In a continuous sequence it tensions and cuts the strapping, automatically feeds the seal and crimps it to complete the operation. The seal magazine holds a clip of 75 seals.

Tools can be released at any point in the strapping cycle if it is necessary to relocate the strap. Because of the tool design, straps can be tensioned to full strength. Normally it is used on top of the container or skid but is equipped to accommodate a suspending hook.

Check No. 11 on Reply Card for more Details

A-Frame for Sheet Material

Constructed entirely of heat treated aluminum extruded shapes and angles, and made by Tobey Mfg. Corp., 1221 El Segundo Blvd., El Segundo, Calif., is an A-frame for handling sheet metal, glass, plastics and other materials handled in sheet form. Light weight of frame makes freight charges from a plant to another



plant a minor consideration. Frame is so balanced that if overloaded on one side, it will not tip when moved sideways.

To eliminate possibility of scratching the sheets being carried, the frame is available with a felt-covered bearing surface. Handles on either end make for convenient ease of handling, these being optional equip-

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Lower Your Carbide Grinding Costs

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CRYSTOLON WHEELS *in the New K-Bond*

A faster and freer cutting action combined with greatly increased uniformity in grinding action — this is what you get with the *new Norton K-Bond*, a new vitrified bond for CRYSTOLON grinding wheels both green and gray. The high rate of stock removal and the cool cutting action of the new K-Bond speed up the grinding operation and help eliminate spoiled tools — thus they reduce the over-all grinding costs.

Also, the Norton K-Bond has brought about a new standard of uniformity to vitrified bonded silicon carbide wheels. These products can now be controlled to such a degree of accuracy as to make is possible to produce wheels of half grade increments of hardness. Thus Norton wheel specifications can be "pin-pointed" to suit the individual requirements of your carbide grinding jobs.

In plant after plant, the new K-Bond CRYSTOLON wheels are showing remarkable results. *You will want to try them, too.*

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DIAMOND WHEELS
in Vitrified, Resinoid, and Metal Bonds

FOR the plant that is grinding carbide tools in any appreciable quantity, diamond wheels are unquestionably the most economical because of their faster cutting action and longer life. And with Norton diamond wheels this is especially true because the *three types of bond* make it possible to supply exactly the right wheel — the most economical wheel — for each job.

Vitrified Bond — combining a fast cutting action with long life it is outstanding for sharpening single-point tools. It is also popular for chip breaker wheels ¼" or more thick.

Resinoid Bond — first choice for all fixed feed operations such as surface and cylindrical grinding and the sharpening of multi-tooth cutters; also used for thin chip breaker wheels.

Metal Bond — used for sharpening single-point tools when maximum wheel life is the first consideration; also in cut-off wheels for cutting carbide blanks.

W-1301

A 140-page, newly revised handbook on carbide grinding—free on request. Ask for Form 167 B-2

Making better products to make other products better

ment. They may also be equipped with Aerol wheels and casters which are permanently sealed. Frames are made in any size or capacity and are also available without wheels.

Check No. 12 on Reply Card for more Details

Heavy Duty Electric Tractor

Developing a maximum tractive effort in excess of 4000 pounds is a two-motor, 4-wheel drive, 4-wheel steer heavy duty electric industrial tractor, designed by Mercury Mfg.

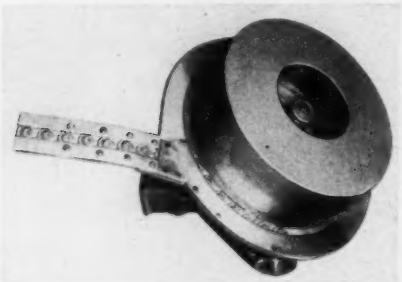
Co., 4140 S. Halsted St., Chicago, Ill. Light travel speed of the unit is over 6 mph.

Tractor less coupler is 84 inches long, 44 inches wide and 66 inches high. Wheel base is 50 inches and outside turning radius is 92 inches. Each separately powered drive axle is of the fully enclosed double reduction spiral bevel and spur gear type. A four-speed magnetic contactor travel controller with foot accelerator of automatically controlled type is featured.

Check No. 13 on Reply Card for more Details

Automatic Hopper Feed

Completely automatic and self-contained is the model 100 driven automatic hopper feed, produced by Feed-all Machine & Engineering Co., 29 Elm St., Willoughby, O. A selector



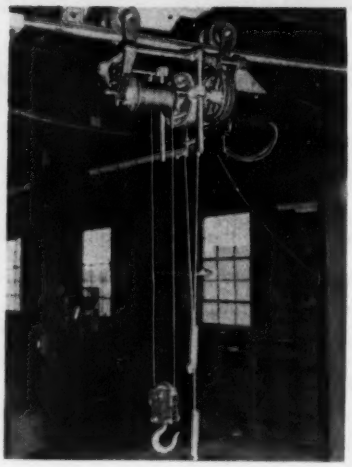
ring driven by a fractional horsepower motor rotates through the work which is selected and fed from the underside of the ring. Unit is adapted to feeding of flat cylindrical work such as washers, nuts, bearing races, etc.

Among the many uses for the feeder are the application to assembling presses, automatic welding machines and many second operation machines.

Check No. 14 on Reply Card for more Details

Electric Hoist

Capable of lifting 500 pounds at 25 fpm or 250 pounds at 50 fpm is the multipurpose power hoist manufactured by Flinchbaugh Co., York, Pa. The electric unit is offered with adjustable track trolleys for both single or double wheel tracks, a ¼-hp single-phase reversing motor, cable for 10 and 20-foot lifts, grooved drum,



automatic brake and conventional hook attachments.

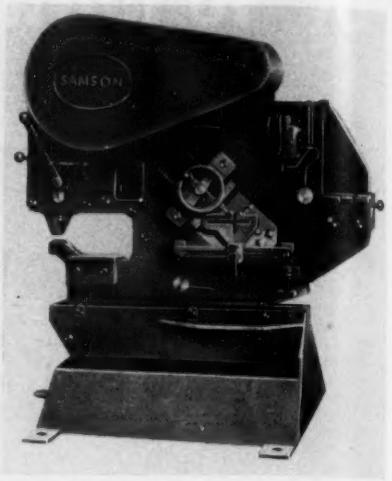
Hoist will lift or pull distances up to 200 feet. In addition to hoisting, it can easily be adapted as a power unit at 62 rpm for running grindstones, or any other drive application that is suitable to speed and power rating.

Check No. 15 on Reply Card for more Details

Performs Several Operations

Capable of performing a number of different operations is the size No. 10 universal fabricator offered by Julius Blum & Co. Inc., 532 W. 22nd St., New York 11, N. Y. The punch handles webs and flanges of beams, channels and columns as well as angles and flat stock. A shear cuts plates and sheets of any length or width and trims angles, while a bar cutter cuts rounds and squares, angles and tees. A coper notches a 90 degree V on angles and tees and copes structural shapes and plate.

Standard equipment includes two interchangeable die blocks which enable the punch to handle a wider range of shapes, one-shot centralized lubrication and a complete set of guards. Swing-away punch stripper, bar cutter stripper and shear hold-



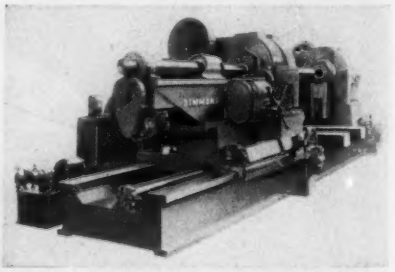
down and rollers embedded in shear table are time saving devices built into the machine.

Check No. 16 on Reply Card for more Details

Bores Cylindrical Work

Simmons Machine Tool Corp., Albany, N. Y., is building a 6-inch bar horizontal boring and facing machine for all types of cylindrical work where it is necessary to bore large holes of long depth accurately. In addition to the bar feed in the head, entire boring and facing unit moves hydraulically along the bed. Designed to use carbide tooling, machine delivers a range of bar speeds of between 3 and 150 rpm and bar feeds from 0.0005 to 0.500-inch per revolution.

Machine is equipped with a con-



tinuous feed facing head. The basic boring and facing unit can be adapted to a large variety of work. Standard length of the bar is 17 ft and the travel in one setting is 60 inches. Bed lengths and widths can be supplied to meet requirements.

Check No. 17 on Reply Card for more Details

• • •

REMOVES FERROUS PARTS: For removing ferrous parts and contamination from electroplating tanks, alkali baths, acid baths, etc., Eriez Mfg. Co., Erie, Pa., offers a perman-

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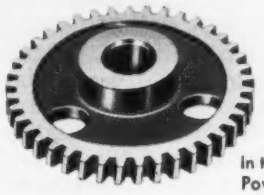

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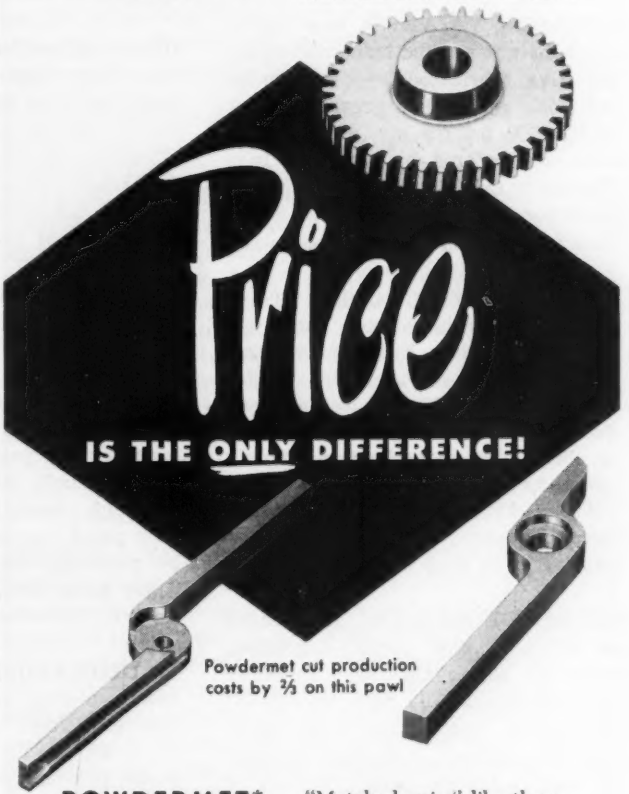

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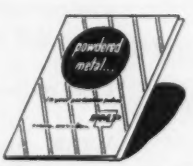

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ent magnetic device. It operates like a carpet sweeper, with the magnetic tube mounted between Neoprene wheels. Ferrous material moves to the magnet and spreads itself over entire circumference to a thickness of about ¾-inch.

Check No. 18 on Reply Card for more Details

CYLINDER VALVE: A new corrosion resistant air and hydraulic cylinder valve, fabricated from solid brass bar stock and with a pressure range up to 1500 psi for air, oil or water service, is offered by Airmatic Inc., Cleveland, O. Valve head, cap and mounting are unbreakable.

Check No. 19 on Reply Card for more Details

WELDING ELECTRODES: Three new additions have been added to their line of low hydrogen welding electrodes by Arcos Corp., Philadelphia 43, Pa. Known as Tensilend electrodes, they simplify fabrication by elimination of preheat in welding low alloy high strength steels in the 70,000, 100,000 and 120,000 psi tensile strength class.

Check No. 20 on Reply Card for more Details

METAL DEGREASER: Designated as Q200, a new metal degreaser, made by Barco Chemical Products Co., Chicago 5, Ill., will remove all oil, grease and waxes from most metals or alloys. It is not necessary to heat it before using. Metals or plastics are degreased either by immersion of parts in fluid, dipping and brushing or wiping.

Check No. 21 on Reply Card for more Details

ALL-SERVICE HOSE: Servall, a new all-service hose, developed by Hewitt-Robins Inc., Buffalo 5, N. Y., is recommended for intermittent, light duty service in handling air, water, moderate amounts of gasoline, oil, mild chemicals and other fluids.

Check No. 22 on Reply Card for more Details

SMUDGE-PROOF TAPE: Labelon, a patented smudge-proof labeling tape, is introduced by Labelon Tape Co., Rochester, N. Y. It is water and oilproof, acid resistant and will withstand temperatures up to 150° F. Made of two sheets of acetate tape with a special carbon material sealed between, identification cannot be erased, smudged or rubbed off.

Check No. 23 on Reply Card for more Details

HYDRAULIC CYLINDERS: Hannifin Corp., Chicago 24, Ill., offers a standardized line of hydraulic cylinders built especially for "push" stroke applications using up to 5000 psi pressure. Designated as the Hy-Power line, cylinders are intended for use in combination with the company's HY-Power generator. Cylinders are available in nine sizes ranging from 2 to 7¼-inch bore, and with strokes up to 6 inches on largest sizes.

Check No. 24 on Reply Card for more Details

HEAT RESISTANT PAINT: Heat-Rem, high heat resistant aluminum paint, has been improved by the addition of silicone, according to the manufacturer, Speco Inc., Cleveland 9, O. It is made for use on exterior and interior metal surfaces where temperature range of 1000 to 1500° F is encountered.

Check No. 25 on Reply Card for more Details

PAINT-BONDING PROCESS: Poly-Kote was developed by Kelite Products Inc., Los Angeles 54, Calif., for the treatment of iron and steel preparatory to painting. It forms a dense smooth film of low porosity and high plasticity which cannot absorb paint excessively. Coating can be controlled to provide a light or heavy paint bonding film.

Check No. 26 on Reply Card for more Details

MULTIPURPOSE GREASE: Alvania, a new multipurpose grease, available from Shell Oil Co., New York 20, N. Y., has a high melting point, provides resistance to heat and water. It is pumpable at low temperatures, even in unheated storage, yet it maintains its consistency almost indefinitely and keeps leakage down to a minimum. It also resists hardening and drying, prevents excessive wear and is nontoxic.

Check No. 27 on Reply Card for more Details

AC-DC COATINGS: Stoody Co., Whittier, Calif., announces new alternating-direct current coatings for several of their electrodes. Among these are Stoodite, Tube Borium and Borod.

Check No. 28 on Reply Card for more Details

WIRE BRUSH: Skilsaw Inc., Chicago 30, Ill., offers the Skil Flex wire brush, designed for practically all standard portable or stationary shop equipment and for power brushing operations such as removing scale, rust, carbon paint, weld spatter, etc. Wires are completely locked in a solid rubber core. Brushes are available in 4, 6, 7 and 8-inch diameters.

Check No. 29 on Reply Card for more Details

TEMPERATURE, PRESSURE UNITS: Ratotherm temperature instruments have thermal systems filled with liquid, vapor-liquid or gas covering ranges between minus 125° F and plus 1000° F. Ratogage pressure instruments have bellows, multiple-diaphragm, slack-diaphragm or helical pressure measuring elements covering ranges between 20 inches of mercury vacuum and 10,000 psi. Instruments are made by Fischer & Porter Co., Hatboro, Pa.

Check No. 30 on Reply Card for more Details

SETUP BLOCK: A setup block, offered by Reid Tool Supply Co., Muskegon Heights, Mich., is made of cast iron and constructed like a pyramid with 4-inch square base and 4-inch height with steps in increments of ¼-inch on the sides. By turning block from side to side, proper step on which to rest clamp when setting up a job can be selected.

Check No. 31 on Reply Card for more Details

OILERS FOR DIE SETS: Die-Co oilers for die sets are available from Die Supply Co., Cleveland 3, O. Each cup is made of clear, shockproof plastic, molded to an aluminum insert that is fitted with a Neoprene O ring which prevents loss of lubricant and wipes abrasive dirt from pins. Pins and bushings are kept clean and protected by a small amount of grease.

Check No. 32 on Reply Card for more Details

INTERCHANGEABLE PUNCHES: A complete line of standardized interchangeable round punches made of high speed steel is introduced by Richard Brothers Division, Allied Products Corp., Detroit 11, Mich. Punches incorporate R-B interchangeable feature in which ball bearing lock in retainer engages in a ball seat on punch shank, providing secure positioning both radially and vertically.

Check No. 33 on Reply Card for more Details

BRAKE-MOTOR: General Electric Co., Schenectady 5, N. Y., offers its line of Tri-Clad motors equipped with Stearns magnetic brakes as unit apparatus. All types of Tri-Clad motors up to 20 hp, 90 foot-pounds static torque are available with the explosionproof, electrically operated brake.

Check No. 34 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

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Market Summary

STRINGENCY in steel supply is increasing. Consumers report conditions almost as bad as during the shortage of 1947-48. No early relief is sighted despite record production. Demand pressure still rises. Not only is supply tight in the light, flat-rolled products and pipe, but mill order backlogs are mounting in plates, shapes, bars and some specialties. Tonnage carryover into third quarter, especially sheets and strip, will support high-level steelmaking beyond Labor Day. More buyers are turning to the premium markets for stop-gap and insurance tonnage. Conversion business is gaining. Gray market offerings are receiving more attention. Imported steel is being purchased in larger volume.

PRODUCTION—Steel output rose to an all-time weekly high last week, furnaces operating at 101.5 per cent of capacity and producing 1,940,000 tons. This compares with 101 per cent the preceding week. Operations increased 4 points to 91 per cent in St. Louis, 3 points to 106 at Cincinnati, 1.5 points to 108 at Wheeling, and 1 point to 101.5 in Pittsburgh, 103 in Detroit and 85 in New England. The Cleveland rate eased ½ point to 99 per cent, and in the Far West operations went down 1 point to 94.5.

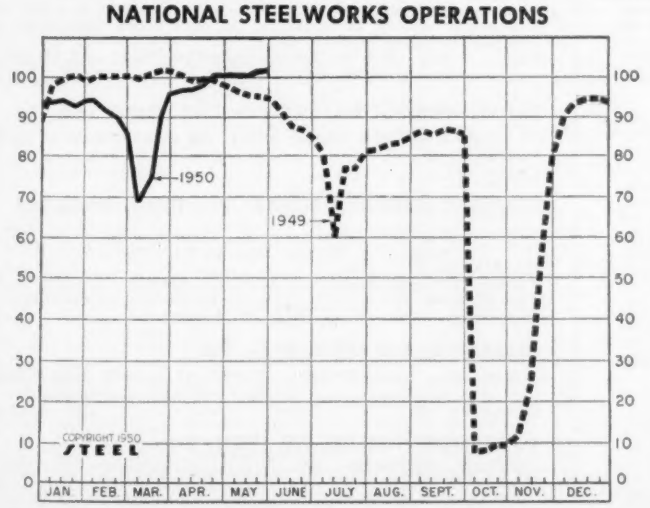
PRICES—Rising costs are exerting renewed upward pressure on finished steel prices. Isolated advances hint of a possible general rise in the making. Sharply increased scrap prices are a factor in the current advances. Nonintegrated mills are paying more for their raw steel, $61 to $82 for sheet bars, and they are passing these higher costs along to sheet buyers. Indicative of current price action, Follansbee Steel Corp., has increased cold-rolled sheets $20 per ton and raised the extra on blued stove sheets $5. McLouth Steel Corp. has upped hot and cold-rolled strip $12. Superior Steel Corp. has increased prices on copper-clad strip. Operators of hand sheet mills are booked into October at $140 to $150 per ton on hot-rolled sheets and $160 to $180 on galvanized sheets. Some small sheetmakers are basing their quotations on the price they must pay for scrap in conversion deals. Warehouse prices are up $1 to $4 on a number of products.

COMPOSITES—Exceptionally strong market situation in scrap is reflected in a sharp rise in STEEL's price composite on steelmaking grades to $35.50 from $33.83 a week ago. Another shortage of scrap appears developing and the market is in a highly confused state. Steelmakers are taking steps to import metal, orders reported being placed for hundreds of thousands of tons of German material. STEEL's arithmetical price composite on finished steel reflects isolated advances the past week, now standing at $94.23 compared with $93.23 a week ago. The weighted index on finished steel, however, is unchanged at 156.13. Pig iron composites also are unchanged with No. 2 foundry, $46.47, basic, $45.97, and malleable, $47.27.

DEMAND—Memorial holiday suspensions brought some requests to the steel mills to hold up shipments. Aside from this, no interruption in heavy movement of steel into consumption is indicated in the offing. Active metalworking operations appear assured throughout summer with peaceful settlement of the General Motors wage negotiations imparting a strong note of optimism for the months immediately ahead. The outlook beyond summer also appears promising of heavy steel demand.

SUPPLY—There is little chance for any easing in steel supply conditions until well into summer, if then. Certainly with flat-rolled order backlogs extending into fourth quarter it is unlikely consumers will be able to entirely satisfy their immediate requirements in the regular market. This probably means further stimulation of conversion and gray market business in the weeks ahead.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended May 27	Change	Same Week 1949	Same Week 1948
Pittsburgh	101.5	+ 1	94	96
Chicago	104	— 1.5*	99	94
Eastern Pa.	98	0	91.5	90
Youngstown	107	0	105	103
Wheeling	108	+ 1.5	86	97
Cleveland	99	— 0.5*	104.5	97
Buffalo	104	0	96	93
Birmingham	100	0	100	100
New England	85	+ 1	56	78
Cincinnati	106	+ 3	94	102
St. Louis	91	+ 4	78	85
Detroit	103	+ 1	70	100
Western	94.5	— 1	85	..
Estimated national rate	101.5	+ 0.5	94.5	96

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
*Change from revised rate.

News Summary—p. 27 *Production-Engineering News—p. 57*

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Composite Market Averages

	May 25 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.13	156.13	156.13	152.90	101.10
Index in cents per lb....	4.230	4.230	4.230	4.142	2.739
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.23	$93.23	$93.23	$92.77	$58.27
No. 2 Fdry. Pig Iron, GT	46.47	46.47	46.47	46.07	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	45.60	24.00
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.27	25.29
Steelmaking Scrap, GT..	35.50	33.83	30.17	22.00	19.00

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	May 25 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, C.F., Pittsburgh ...	4.10–15	4.10–15	4.10–15	3.95-4.00	2.65
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ..	3.60	3.60	3.60	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.45	2.25
Plates, Claymont, Del. ...	3.60	3.60	3.60	3.65	2.25
Sheets, H.R., Pittsburgh ..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago ...	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago ...	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.25	3.25	3.25	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh ...	4.15	4.15	4.15	4.00–75	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–40	4.35–40	4.35–40	4.20–45	2.90
Wire, Basic, Pittsburgh ..	4.50	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh...	5.30	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT).....	58.00	57.00–58.00	57.00–58.00	67.00	36.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts...	3.85	3.85	3.85	3.775	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$25.50
Basic, Valley	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	49.44	49.44	49.44	49.39	26.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.25	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	49.89	26.84
No. 2 Fdry, Birm.	42.38	42.38	42.38	39.38	21.38
No. 2 Fdry. (Birm.)del.Cin.	49.08	49.08	49.08	45.43	25.06
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts..	$39.00	$38.00	$34.00	$23.00	$20.00
No. 1 Heavy Melt. E. Pa..	32.50	29.00	27.00	21.50	18.25
No. 1 Heavy Melt. Chicago	35.00	34.50	29.50	21.50	18.75
No. 1 Heavy Melt. Valley.	38.75	37.75	33.75	22.00	20.00
No. 1 Heavy Melt. Cleve..	35.25	34.25	30.25	18.50	19.50
No. 1 Heavy Melt. Buffalo.	34.50	31.75	29.75	22.25	19.25
Rails, Rerolling, Chicago..	49.50	48.50	46.50	27.75	22.25
No. 1 Cast, Chicago	46.50	42.50	42.50	27.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$14.25	$7.00
Beehive, Fdry., Connlsvl...	15.50	16.00	16.00	16.75	7.75
Oven Fdry., Chicago	21.00	21.00	21.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	20.50	20.50	19.50	17.625	12.00
Zinc, E. St. Louis	12.50	12.00	11.00	11.00	8.25
Lead, St. Louis	11.80	11.80	10.80	12.85	6.35
Tin, New York	78.50	77.50	76.75	103.00	52.00
Aluminum, del.	17.50	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	24.50	24.50	24.50	38.50	14.50
Nickel, refinery, duty paid.	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del.	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward, Ala. W15	41.88	42.38	....	....
Cincinnati, del.	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda, N.Y., W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y., T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
Indiana Harbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14 Y1	46.00	46.50	46.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
Los Angeles, San Francisco, del. ...	53.70	54.20	....	....
Granite City, Ill. M10	47.90	48.40	48.90	....
St. Louis, del. (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
Neville Island, Pa. P6	46.00	46.50	46.50	47.00
Pitts, N. & S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKees Rocks, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	47.44	47.94	47.94	48.44
Verona, del.	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O. del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson, O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

Niagara Falls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2..	82.00
Wenatchee, Wash., OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged from silicon over base grade; also for hard chilling iron Nos. 5 x 6)

Lyles, Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, May 25, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 .....$50.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)
Detroit R7 .....$51.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ...51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 .....$53.00
Clairton,Pa. C3 .....53.00
Conshohocken,Pa. A3 ..58.00
Ensley,Ala. T2 .....53.00
Fairfield,Ala. T2 .....53.00
Fontana,Cal. K1 .....72.00
Gary,Ind. C3 .....53.00
Johnstown,Pa. B2 .....53.00
Lackawanna,N.Y. B2..53.00
Munhall,Pa. C3 .....53.00
Sharon,Pa. S3 .....57.00
So.Chicago,Ill. C3 ....53.00
So.Duquesne,Pa. C3 ...53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 .....$63.00
Buffalo R2 .....63.00
Canton,O. R2 .....63.00
Clairton,Pa. C3 .....63.00
Cleveland R2 .....63.00
Conshohocken,Pa. A3..65.00
Detroit R7 .....63.00
Ensley,Ala. T2 .....63.00
Fairfield,Ala. T2 .....63.00
Fontana,Calif. K1 .....82.00
Gary,Ind. C3 .....63.00
Geneva,Utah G1 .....63.00
Houston,Tex. S5 .....71.00
Ind.Harbor,Ind. I-2 ...63.00
Johnstown,Pa. B2 .....63.00
Lackawanna,N.Y. B2..63.00
Los Angeles B3 .....82.00
Munhall,Pa. C3 .....63.00
Seattle B3 .....82.00
So.Chicago C3,R2,W14.63.00
So.Duquesne,Pa. C3 ..63.00
So.SanFrancisco B3 ...82.00
Warren,O. C17 .....63.00

Alloy (NT)
Bethlehem,Pa. B2 ....$66.00
Buffalo R2 .....66.00
Canton, O. R2, T7 ....66.00
Conshohocken,Pa. A3..68.00
Detroit R7 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. C3 .....66.00
Houston,Tex. S5 .....74.00
Ind.Harbor,Ind. Y1 ...66.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....86.00
Massillon,O. R2 .....66.00
Midland,Pa. C18 .....66.00
Munhall,Pa. C3 .....66.00
Sharon,Pa. S3 .....66.00
So.Chicago C3,R2,W14. 66.00
So.Duquesne,Pa. C3 ..66.00
Warren,O. C17 .....66.00
Youngstown Y1 .....66.00

SHEETS BARS (NT)
Mansfield,O. E6 .....$58.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Gary,Ind. C3 .....76.00
Ind.Harbor,Ind. I-2 ...76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ....76.00
So.Duquesne,Pa. C3 ..76.00

SKELP
Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.15
Warren,O. R2 .....3.15
Youngstown C3, R2 ....3.15

WIRE RODS
AlabamaCity,Ala. R2 ..3.85
Buffalo W12 .....3.85
Cleveland A7 .....3.85
Donora,Pa. A7 .....3.85
Fairfield,Ala. T2 .....3.85
Houston,Tex. S5 .....4.25
Ind.Harbor,Ind. Y1 ....3.85
Johnstown,Pa. B2 .....3.85
Joliet,Ill. A7 .....3.85
LosAngeles B3 .....4.65
Minnequa,Colo. C10 ....4.10
Monessen,Pa. P7 .....3.85
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ...4.50
Portsmouth,O. P12 ....3.85
Roebling,N.J. R5 .....3.95
So.Chicago,Ill. R2 .....3.85
SparrowsPoint B2 .....3.95
Sterling,Ill.(1) N15 ....3.85
Struthers,O. Y1 .....3.85
Torrance,Calif. C11 ....4.65

STRUCTURALS
Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 .....3.40
Bessemer,Ala. T2 .....3.40
Bethlehem,Pa. B2 .....3.45
Clairton,Pa. C3 .....3.40
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Houston, Tex. S5 .....3.80
Ind.Harbor,Ind. I-2 ....3.40
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.00
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.00
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.40
Niles,Calif.(22) P1 ....4.02
Phoenixville,Pa. P4 ....3.30
Portland,Oreg. O4 .....3.90
Seattle B3 .....4.05
So.Chicago,Ill. C3, W14.3.40
So.SanFrancisco B3 ....3.95
Torrance,Calif. C11 ....4.00
Weirton,W.Va. W6 .....3.40

Alloy Stand. Shapes
Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05

H.-S. Low-Alloy Stand. Shapes
Aliquippa,Pa. J5 .....5.15
Bessemer,Ala. T2 .....5.15
Bethlehem,Pa.(14) B2 ..5.20
Clairton,Pa. C3 .....5.15
Fairfield,Ala T2 .....5.15
Fontana,Calif. K1 .....5.75
Gary,Ind. C3 .....5.15
Ind.Harbor,Ind. I-2, Y1.5.15
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y.(14)B2 5.20
Munhall,Pa. C3 .....5.15
So.Chicago,Ill. C3 .....5.15
Struthers,O. Y1 .....5.15

Wide Flange
Bethlehem,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 .....3.40

H.-S., L-A Wide Flange
Munhall,Pa. C3 .....5.10
So.Chicago,Ill. C3 .....5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.20
Lackawanna,N.Y. B2 ..4.20
Munhall,Pa. C3 .....4.20
So.Chicago,Ill. C3 .....4.20
Weirton,W.Va. W6 .....4.20

BEARING PILES
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 ....3.40

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.50
Aliquippa,Pa. J5 .....3.50
Ashland,Ky.(15) A10 ..3.50
Bessemer,Ala. T2 .....3.50
Clairton,Pa. C3 .....3.50
Claymont,Del. W16 ....3.60
Cleveland J5, R2 .....3.50
Coatesville,Pa. L7 .....3.60
Conshohocken,Pa. A3 ..3.60
Ecorse,Mich. G5 .....3.75
Fairfield,Ala. T2 .....3.50
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.50
Geneva,Utah G1 .....3.50
Harrisburg,Pa. C5 .....3.50
Houston,Tex. S5 .....3.90
Ind.Harbor,Ind. I-2, Y1.3.50
Johnstown,Pa. B2 .....3.50
Lackawanna,N.Y. B2 ..3.50
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.50
Pittsburgh J5 .....3.50
Seattle B3 .....4.40
Sharon,Pa. S3 .....3.50
So.Chicago,Ill. C3, W14.3.50
SparrowsPoint,Md. B2..3.50
Steubenville,O. W10 ....3.50
Warren,O. R2 .....3.50
Weirton,W.Va. W6 .....3.50
Youngstown C3, R2, Y1.3.50

PLATES (Universal Mill)
Fontana,Calif. K1 .....4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.25

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ..4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.35
Bessemer,Ala. T2 .....5.35
Clairton,Pa, C3 .....5.35
Cleveland J5, R2 .....5.35
Conshohocken,Pa. A3 ..5.35
Ecorse,Mich. G5 .....5.60
Fairfield,Ala. T2 .....5.35
Fontana,Calif. K1 .....5.95
Gary,Ind. C3 .....5.35
Geneva,Utah G1 .....5.35
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I-2, Y1.5.35
Johnstown,Pa. B2 .....5.35
Munhall,Pa. C3 .....5.35
Pittsburgh J5 .....5.35
Sharon,Pa. S3 .....5.35
So.Chicago,Ill. C3 .....5.35
SparrowsPoint,Md. B2 ..5.35
Warren,O. R2 .....5.35
Youngstown Y1 .....5.35

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ..4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.75
Ashland,lcl(15) A10 ...4.25
Cleveland,cl R2 .....4.10
Warren,O.cl R2 .....4.10

PLATES, Wrought Iron
Economy,Pa. B14 .....7.85

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.45
Aliquippa,Pa. J5 .....3.45
Alton,Ill.(1) L1 .....3.45
Ashland,Ky.(17) A10 ..3.45
Atlanta,Ga. A11 .....3.60
Bessemer,Ala. T2 .....3.45
Buffalo R2 .....3.45
Canton,O. R2 .....3.45
Clairton,Pa. C3 .....3.45
Cleveland R2 .....3.45
Ecorse,Mich. G5 .....3.65
Emeryville,Calif. J7 ...4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 .....4.05
Lackawanna,N.Y. B2 ..3.45
Los Angeles B3 .....4.15
Midland,Pa. C18 .....3.45
Milton,Pa. B6 .....3.45
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.17
N.Tonawanda,N.Y. B11 .3.45
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 .....4.20
Seattle B3, N14 .....4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 ....3.45
S.SanFran.,Cal. B3 ....4.20
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Weirton,W.Va. W6 .....3.45
Youngstown C3, R2 ....3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.45
Atlanta A11 .....3.60
Johnstown,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Niles,Calif. P1 .....4.17
Pittsburgh(23) J5 .....3.45
Portland,Oreg. O4 .....4.20
SanFrancisco S7 .....4.00
Weirton,W.Va. W6 ....3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2, T7 .....3.95
Clairton,Pa. C3 .....3.95
Ecorse,Mich. G5 .....4.25
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....3.95
Houston,Tex. S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ..3.95
Los Angeles B3 .....5.00
Massillon,O. R2 .....3.95
Midland,Pa. C18 .....3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 ....3.95
Struthers,O. Y1 .....3.95
Warren,O. C17 .....3.95
Youngstown C3 .....3.95

BARS, Hot-Rolled Ingot Iron
Ashland,Ky.(17) A10 ..3.70

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Bethlehem,Pa. B2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland R2 .....5.20
Ecorse,Mich. G5 .....5.40
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....6.25
Gary,Ind. C3 .....5.20
Ind.Harbor,Ind. I-2, Y1.5.20
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
Pittsburgh J5 .....5.20
So.Duquesne,Pa. C3 ....5.20
Struthers,O. Y1 .....5.20
Youngstown C3 .....5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.15
Ambridge,Pa. W18 .....4.15
BeaverFalls,Pa. M12,R2.4.15
Buffalo B5 .....4.15
Camden,N.J. P13 .....4.63
Carnegie,Pa. C12 .....4.15
Chicago W18 .....4.15
Cleveland A7, C20 .....4.15
Detroit P17 .....4.30
Donora,Pa. A7 .....4.15
Ecorse,Mich. G5 .....4.35
Elyria,O. W8 .....4.15
FranklinPark,Ill. N5 ...4.15
Gary,Ind. R2 .....4.15
Hammond,Ind. L2, M13.4.15
Hartford, Conn. R2 ....4.55
Harvey,Ill. B5 .....4.15
LosAngeles R2 .....5.55
Mansfield,Mass. B5 ....4.55
Massillon,O. R2, R8....4.15
Midland,Pa. C18 .....4.15
Monaca,Pa. S17 .....4.15
Newark,N.J. W18 .....4.55
Plymouth.Mich. P5 ....4.40
Pittsburgh J5 .....4.10
Putnam, Conn. W18 ....4.55
Readville,Mass. C14 ...4.55
St.Louis,Mo. M5 .....4.55
So.Chicago,Ill. W14 ....4.15
SpringCity,Pa.(5) K3 ...4.55
Struthers,O. Y1 .....4.15
Waukegan,Ill. A7 .....4.15
Youngstown F3, Y1 ....4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.90
Ambridge,Pa. W18 .....4.90
BeaverFalls,Pa. M12 ...4.90
Bethlehem,Pa. B2 .....4.90
Buffalo B5 .....4.90
Canton,O. R2, T7 .....4.90
Carnegie,Pa. C12 .....4.90
Chicago W18 .....4.90
Cleveland A7, C20 .....4.90
Detroit P17 .....5.05
Donora,Pa. A7 .....4.90
Elyria,O. W8 .....4.90
Gary,Ind. R2 .....4.90
Hammond,Ind. L2, M13.4.90
Hartford,Conn. R2 .....5.20
Harvey,Ill. B5 .....4.90
Lackawanna,N.Y. B2 ..4.90
Mansfield,Mass. B5 ....5.20
Massillon,O. R2, R8 ...4.90
Midland,Pa. C18 .....4.90
Monaca,Pa. S17 .....4.90
Newark,N.J. W18 .....5.20
Plymouth,Mich. P5 .....5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 .....4.90
Waukegan,Ill. A7 .....4.90
Warren,O. C17 .....4.90
Worcester,Mass. A7 ....5.20
Youngstown F3, Y1 ....4.90

RAIL STEEL BARS
ChicagoHts. (3) C2, I-2 .3.30
ChicagoHts. (4) C2, I-2 .3.45
Franklin,Pa. (3) F5 ...3.30
Franklin,Pa. (4) F5 ...3.45
FortWorth,Tex.(26) T4 .4.33
Huntngtn,W.Va.(3) W7 .3.45
Moline,Ill.(3) R2 .....3.40
SouthAvis,Pa.(2) J8 ...3.30
SouthAvis,Pa.(41) J8 ..3.30
SouthAvis,Pa.(42) J8 ..3.30
Williamsport(2,3) S19 ..3.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.9.50
Economy,Pa.(D.R.)B14 11.00
Economy,(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng. Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1..12.25
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ...11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..4.50
Johnstown, ¼-1" B2 ...4.35
Los Angeles B3 .....5.00
Seattle B3, N14 .....5.10
SouthAvis,Pa. J8 .....4.35
So.SanFrancisco B3 ....5.00
SparrowsPt., ¼-1" B2 ..4.35
Williamsport,Pa. S19 ..4.35

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.45
Alton,Ill.(6) L1 .....3.45
Atlanta,Ga. A11 .....3.60
Buffalo R2 .....3.45
Cleveland R2 .....3.45
Emeryville,Calif. J7 ...4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2,Y1..3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.45
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.17
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
Sharon,Pa. S3 .....3.45
So.Chicago,Ill. W14 ....3.45
SparrowsPoint,Md. B2 ..3.45
Steubenville,O. W10 ....3.45
Torrance,Calif. C11 ....4.05
Warren,O. R2 .....3.45
Weirton,W.Va. W6 .....3.45
Youngstown C3, Y1 ....3.45

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.50
Dover,O. R1 .....4.65
Ind.Harbor,Ind. I-2 ....4.40
Mansfield,O. E6 .....4.15
Niles,O. N12 .....4.10
Niles,O. M4 .....4.65
Torrance,Calif. C11 ....5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.05
Conshohocken,Pa. A3 ..5.05
Ecorse,Mich. G5 .....5.25
Fairfield,Ala. T2 .....5.05
Fontana,Calif. K1 .....6.74
Gary,Ind. C3 .....5.05
Ind.Harbor,Ind. I-2, Y1.5.05
Irvin,Pa. C3 .....5.05
Lackawanna(35) B2 ...5.05
Pittsburgh J5 .....5.05
Sharon,Pa. S3 .....5.05
So.Chicago,Ill. C2 .....5.05
SparrowsPoint(36) B2 ..5.05
Warren,O. R2 .....5.05
Weirton,W.Va. W6 ....5.05
Youngstown, C3, Y1....5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.20
Ecorse,Mich. G5 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. C3 .....6.20
Ind.Harbor,Ind. I-2, Y1.6.20
Irvin,Pa. C3 .....6.20
Lackawanna(37) B2 ...6.20
Pittsburgh J5 .....6.20
Sharon,Pa. S3 .....6.20
SparrowsPoint(38) B2 ..6.20
Warren,O. R2 .....6.20
Weirton,W.Va. W6 ....6.20
Youngstown Y1 .....6.20

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	*5.10*
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Gal'vd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.15
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Well Casing

Torrance,Calif. C11	4.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, Aluminized

Butler,Pa. A10	7.75

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.20	6.70	...	...
Niles,O. M4 (24 Gage)	5.65	5.95	6.45	...	...
Parkersburg F4 (cut lengths)	...	...	6.70	7.95	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Parkersburg F4 (cut lengths)	9.30	....	....	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Gran.City,Ill. G4	7.50	7.70
Ind.Harbor I-1, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.90
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Conshohocken,Pa. A3	3.35
Detroit M1	*4.05*
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.50
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	....
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	....
NewCastle,Pa. E5	4.15	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8: Cleve.orPitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.15	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.50	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.15
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15	4.15
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.40
Detroit, D2	4.40
Detroit M1	*4.95*
Dover,O.(40) G6	4.15
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.15
Fontana,Calif. K1	5.40
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass.(21) T6	4.65
Middletown,O. A10	4.15
NewBritain(10) S15	4.15
NewCastle,Pa. B4	4.15
NewCastle,Pa.(40) E5	4.15
NewHaven,Conn. A7, D2	4.65
New York W3	5.00
Pawtucket,R.I.(21) N8	4.65
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.15
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	4.65
Wallingford,Conn. W2	4.65
Warren,O.(40) T5	4.15
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y., B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton, W. Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Son, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

UNIVERSITY OF MICHIGAN LIBRARIES

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.40
Youngstown C3	3.40

WIRE, MB Spring, HighCarbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester A7,J4,T6,W12	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. MS	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7, P16	5.35
Pawtucket,R.I.(12) N8	5.65
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. MS	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20	4.50
Crawfordsville,Ind. MS	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
Los Angeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark, 6-8ga. I-1	5.15
No.Tonawanda B11	4.90
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7, T6	4.80

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy,Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
Los Angeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So. Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity, Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Crawfordsville M8	128
Donora,Pa A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	116
Duluth A7	116
Franklin,Pa. F5	116
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet.Ill. A7	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	120

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity, Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity, Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
Portsmouth,O.(18) P12	113
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

NAILS & STAPLES, Stock To Dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	112
Crawfordsville,Ind. M8	108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensely,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	3.75

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.25
Gary,Ind. C3	5.25
Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25
McKeesRocks,Pa. C3	5.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N. Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburgh,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle I-3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W. Va. W6	4.20

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	9.10
KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	8.85
Pittsburgh O3, P14	9.10
Seattle B3	9.35

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.60
Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo, C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	5.45
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron&Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Steel Div. Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wsrn.Auto. Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr, 1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo.	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.15c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.
(26) Reinforcing, mill shipments; to consumers, 4.83c; fabricated to fabricators, 4.58c.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.40c, 0.035" and heavier.
(41) Flats.
(42) Bands.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	35.5	8.5	9.0	7.5
¼	6.0	0.42	33.5	31.5	32.5	9.5	11.0	8.5
⅜	6.0	0.57	29.0	27.0	28.0	5.5	8.0	4.5
½	8.5	0.85	40.5	38.5	39.5	24.0	22.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	28.0	26.0	27.0
1	17.0	1.68	46.0	44.0	45.0	31.0	29.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	31.5	29.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	32.0	30.0	31.0
2	37.0	3.68	47.5	45.5	46.5	32.5	30.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	33.0	31.0	32.0
3	76.5	7.62	48.0	46.0	47.0	33.0	31.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 42% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1 quotes 2 points lower on ⅛", ¼", ⅜".

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ¼" through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜", W10. Wheatland, Pa., except 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 26.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	20.5
2½	58.5	5.82	39.0	23.5	39.0	23.5
3	76.5	7.62	39.0	23.5	39.0	23.5
3½	92.0	9.20	41.0	25.5	41.0	25.5
4	$1.09	10.89	41.0	25.5	41.0	25.5
5	1.48	14.81	41.0	25.5	41.0	25.5
6	1.92	19.18	41.0	25.5	41.0	25.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2⅛	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10% Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Copper Base Both Sides
302	....	....	....	19.75	21.50–22.50	75.00
304	22.50	26.50	....	20.75	22.50–24.00	77.00
305	....	....	....	....	....	79.00
309	27.00	31.00	....	....	....	....
310	32.50	36.50	....	....	....	105.00
316	27.00	31.00	....	26.00	28.00–32.00	....
317	30.50	34.50	....	....	....	....
318	29.50	33.50	....	....	....	....
321	23.50	27.50	....	23.00	25.00	90.00
347	25.00	29.00	....	24.00	26.00–30.00	94.00
405	18.75	24.75	....	....	....	....
410	18.25	24.25	....	....	....	....
430	18.25	24.25	....	....	....	....
Nickel	27.50	34.50	31.50	41.00	....	88.00
Inconel	36.00	46.00	....	....	....	115.00
Monel	29.00	37.00	26.50	33.50	....	83.00
Copper*	....	....	20.35†	24.95‡	....	....

* Deoxidized. † 16.85c for hot-rolled. ‡ 21.70c for hot-rolled. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville L7; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam.. 27
- ⅝-in. & ⅝-in. 29
- ¾-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up bolts 37

NUTS

H.P. & C.P. Reg. & Heavy Square:	Reg.	Heavy
½-in. and smaller	25	
⅝-in. & ⅝-in.	23	
¾-in.-1½-in.	23	
1⅝ in. and larger.....	16	
H.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	28	25
¾-in.-1½-in. ..	25	23
1⅝ in. & larger	17	16
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	30	27
¾-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)	Hvy.	Reg.	Lght.
½-in. and smaller	35	41	41
⅝-in. & ⅝-in.	30	36	36
¾-in.-1½ in..	27	31	33
1⅝-in. & larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish ..... 63.5 & 10
Plated finishes ... 50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ¼-in. through ⅝-in. .. 50
- ¾-in. through 1 in. .. 43

Longer than 6 in.:
- ¼-in. through ⅝-in... 33
- ¾-in. through 1 in... 13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 46
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41
¼-in. diam. & larger 24
N.F. thread, all diams. . 18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c
⅛-in., under .....43 off

Washers, Wrought

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Type 301 through 347 sheet, except 309 E2.
Baltimore, bars, wire and structurals A10.
Brackenridge,Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.
Cleveland, strip, except Type 309 quoted 51.00c and except Type 416 A7.
Detroit, strip, except Type 309 M1.
Dunkirk,N.Y. bars, wire A4.
Duquesne, Pa., bars C3.
Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Harrison, N. J., Types 302, 304, 316 wire and strip D6.
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c. Type 501, 10.50c, Type 502 11.50c R2.
McKeesport, Pa., bars; sheets except Type 416, C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip except Type 309 bars quoted 41.00c C4.
So. Chicago, Ill., bars & structurals C3.
Syracuse, N. Y., bars wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.
Washington, Pa., bars sheets & strip except Type 309 strip quoted 51.00c J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c, strip 60.00c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, except Type 300 quoted 51.00c A4.
Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 22.00
Toluol, one deg..19.00-24.75
Industrial xylol ..20.50-26.50
Per ton bulk, ovens
Sulphate of ammonia..$32-45
Cents per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.50
Do., less than carlots..14.25
Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.
Imported, net ton, duty paid, metallurgical grade, $39-$40.

METAL POWDERS

(Per pound, f.ob. shipping point in ton lots for minus 100 mesh)

	Cents
Sponge Iron:	
98+% Fe, carlots..	15.00
Swedish, c.i.f. New York, in bags....7.40-8.50	
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns..70.00-135.00	
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots..23.25-26.25	
Copper:	
Electrolytic	27.75
Reduced	27.00
Lead	18.50
Manganese:	
Minus 100-mesh 52.00-55.00	
Minus 35 mesh	48.00
Minus 200 mesh	58.00
Nickel unannealed 61.00-66.00	
Silicon 34.00-40.00	
Solder (plus cost of metal)	8.50
Stainless Steel, 302...	75.00
Tin	86.50
Zinc, 10-ton lots..15.25-18.00	
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb..	3.00
98.8%, minus 65 mesh, freight allowed.	
1000 lb and over..	2.90
less than 1000 lb..3.00	
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb..	2.75
82-88%, freight allowed, 2000 lb and over..	2.40
less than 2000 lb..	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil,fur. .$14.00-14.50
Connellsvil.fdry. .15.00-16.00
New River, foundry...19.00
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens.$22.00
Everett, Mass., ovens New England, del.‡ 23.40
Chicago, ovens 21.00
Chicago del. .....†22.45
Detroit, del. 24.91
Terre Haute, ovens....21.20
Milwaukee, ovens 21.75
Indianapolis, ovens 20.75
Chicago, del. 24.12
Cincinnati, del. 23.67
Detroit, del. 24.65
Ironton, O., ovens 20.40
Cincinnati, del. 22.71
Painesville, O., ovens..21.90
Buffalo, del. 24.02
Cleveland, del. 23.62
Erie, del. 22.04
Birmingham, ovens 19.15
Philadelphia, ovens ...21.25
Neville Island,Pa.,ovens 21.00
Swedeland, Pa., ovens.21.20
Portsmouth, O., ovens..20.15
Cincinnati, del. 22.71
Detroit, ovens 21.65
Detroit, del. 22.65
Buffalo, del. 24.00
Flint, del. 24.09
Pontiac, del. 23.04
Saginaw, del. 24.40

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

UNIVERSITY OF MICHIGAN LIBRARIES

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	5.75	6.84	7.25	6.04	...	5.95	6.64	8.60	5.85	6.10	7.54
New York(c'try)	5.55	6.64	7.05	5.84	...	5.75	6.44	8.40	5.65	5.90	7.34
Boston (city) ..	5.95	6.75	7.22	5.90	...	5.80	6.39	8.70	5.95	6.28	7.48
Boston (c'try) .	5.75	6.55	7.02	5.70	...	5.60	6.19	8.50	5.75	6.08	7.28
Phila. (city) ..	6.45	6.60	7.00	5.90	...	5.75	6.46	8.40	5.50	5.70	6.80
Phila. (c'try)..	6.20	6.35	6.75	5.65	...	5.50	6.21	8.15	5.25	5.45	6.55
Balt. (city) ...	5.35	6.59	6.66	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.46	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Wash. (w'hse).	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††[5]	5.55	5.85	7.15
Buffalo (w'hse)	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††[5]	5.35	5.65	6.95
Pitts. (w'hse)..	5.05	5.80*	6.45-6.70	5.20	6.15	5.00	5.75	9.55††	5.05	5.15	6.40
Detroit (w'hse).	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††[5]	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.20	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse).	5.15	5.95	7.00	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city) ..	5.57	6.14	6.49	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	6.95	5.30	...	5.30	5.85	9.75††[5]	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.75	5.10	...	5.10	5.65	9.55††[5]	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	7.09	5.44	...	5.44	6.09	9.89††[5]	5.59	5.74	6.94
Milwau. (c'try).	5.29	6.09	6.89	5.24	...	5.24	5.89	9.69††[5]	5.39	5.54	6.74
St. Louis (del.).	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††[5]	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††[5]	5.58	5.73	6.93
Kansas City ..	5.65	6.40	7.30	5.70	...	5.60	6.35	10.10	5.65	5.80	7.00
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.20[10]	5.95	6.30[2]	5.25[10]	...	5.15[10]	6.88	...	5.20[10]	5.35[10]	7.63[10]
Birm'hm(w'hse)	5.05[10]	5.80	6.15[2]	5.10[10]	...	5.00[10]	...	...	5.05[10]	5.20[10]	...
Los Ang. (city)	6.00	7.50	7.03[2]	6.05	8.30	6.00	7.75	...	5.90	6.00	8.20
L. A. (w'hse)..	5.80	7.30	7.50[2]	5.85	8.10	5.80	7.55	...	5.70	5.80	8.00
San Francisco .	6.25[9]	7.60[3]	7.50[2]	6.75[9]	8.25[3]	6.15[9]	7.55	...	6.00[9]	6.15[9]	8.10[9]
Seattle-Tacoma.	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [5]—1000 to 1999 lb; [7]—300 to 999 lb; [8]—300 to 499 lb; [9]—400 to 9999 lb; [10]—500 to 9999 lb inclusive.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross tons lots, packed, $199; less gross ton lot, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered: Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 114)

Metal Prices Continue To Rise

Strength in markets is widening, as reflected in ½-cent advance in aluminum. Metalworking industry allowed inventories to drop due to underestimation of 1950 needs

New York—Trend in nonferrous metal markets continues upward. The movement is still strong and is widening, having encompassed aluminum which had held unchanged from Oct. 11, 1948, to May 19, 1950, when prices rose ½-cent a pound. Tin has risen to the highest levels since last December, despite an acknowledged over-production; zinc advanced ½-cent on May 24 to the highest level since May, 1949; lead is at the highest level since early March.

These metals have advanced on heavy buying by consumers. The metalworking industry erred by a wide margin in their forecast of requirements for 1950, and, hence, allowed their inventories to drop to a dangerously low level. Operations of the leading metal consuming industries, including automotive, building and utility industries, have been sustained at an unexpectedly high level. Expectations now are that this pace will continue at least until the final quarter of this year.

Aluminum Rises ½-Cent

Pittsburgh—An increase of one-half cent per pound for 99 per cent aluminum pig and ingot was put into effect May 19 by Aluminum Co. of America.

This price action, first since Oct. 11, 1948, when an increase of 1 cent was effected, brings the price for standard 99 per cent aluminum pig to 16.50c per pound, and for standard 99 per cent ingot in 30-pound size to 17.50c per pound. Quantity extras for pig and ingot also have been altered to include a charge of 2 cents for less than 500 pounds, and 1 cent for 500 to 1999 pounds; formerly 1 cent was charged for any quantity under 2000 pounds.

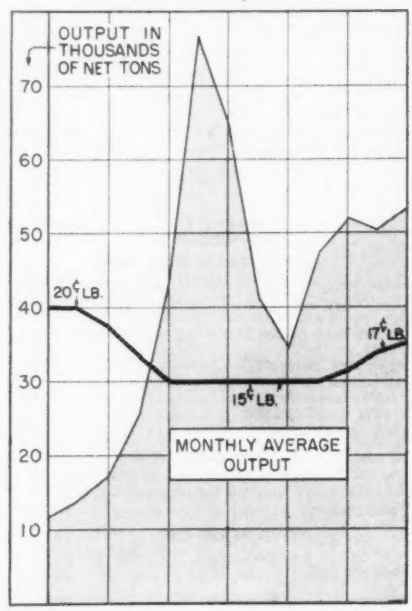
An advance of one-half cent was put into effect on May 22 by Alcoa on wire rods, bars standard rolled shapes, sheets including industrial corrugated, and alloy ingot excepting the magnesium types of 200 series which were increased 1 cent. Grained ingots were increased 1.50 cents, aluminum plate and foil 1 cent per pound on same date. Roofing sheets, coiled or flat, were reduced 1 cent; corrugated and 5-V crimp roofing sheets, 61 cents per square, effective May 23. Alcoa advanced drawn and extruded tubing ½-cent, with extruded tubing 9½ in. o.d. and over increased 1½ cents, effective May 24. Tubular conductors also were advanced ½-cent, and upward adjustments varying over wide range were put into effect on construction and irrigation pipe. No price action was taken on heat exchanger tubes, standard or hand drill pipe and fittings, and conduit. Similarly prices are unchanged for Alclad 56S and electrical conductor redraw rod and wire.

Alcoa has revised policy on freight allowance for shipments of pig and ingots in line with that previously in effect for finished products substituting the word orders for that of shipments of 500 pounds and adding the phrase "accepted for shipment at one time."

Reynolds Metals Co. has followed Alcoa's price action on pig and ingot and stated price adjustments soon will be announced on wrought products. Increased costs under pension program was cited as major cause of price advance by both companies.

Aluminum Production and Prices

. . . move upward



Current delivery is available for bulk of aluminum products within normal processing time. Prospects are good for well sustained demand through third quarter with no evidence of significant change in order pattern throughout the period. Orders for the first five months this year have been slightly in excess of comparable 1949 period.

Output at Six-Year High

Washington—Average daily rate of primary aluminum production in March reached the highest level since August, 1944, Bureau of Mines reports. Output totaled 58,747 tons, or an increase of 16 per cent over the 50,668 tons produced in February. This compared with 54,852 tons in March, 1949.

Shipments similarly attained a two-year high record volume and orders on producers' books seem to assure continuance of demand for primary metal through the first half of the year. Stocks of pig aluminum at the end of March amounted to only 11,648 tons compared with 17,885 tons at the end of February and 28,165 tons at the end of January.

Production of primary aluminum for the first quarter of 1950 totaled 161,438 tons compared with 157,957 tons during the like 1949 period.

Zinc Supplies Tighten

New York—Zinc prices advanced ½-cent a pound on May 24 to the basis of 12.50c, East St. Louis, for prime western. The metal has advanced 2.75 cents a pound from 9.75c since Mar. 14.

Supply of zinc is very tight with few producers able to take additional business of prime western for June or July delivery. The Munitions Board is having difficulty in buying 30,000 tons for second quarter delivery and 15,000 tons for third quarter delivery. Fear of an acute shortage is also enhanced by the government's request for even larger tonnages in the fourth quarter and early 1951.

More zinc is being purchased on an average price basis than at the fixed quotation.

Zinc die casting alloy has advanced ½-cent a pound to 16.50c, delivered, carlots, but most producers are pricing metal at time of shipment. Zinc dust price is up ½-cent to 15.50c, delivered carlots. Rolled zinc products advanced ½-cent to 18.25c on sheets, 17.50c on ribbon zinc, 16.50c on small plates and 17.50c on large plates.

Copper Shortage Increases

New York—Copper consumers are seeking to place more tonnage for July than they have been able to obtain for May and June delivery. However, producers are well sold up for that month. Demand has been consistently in excess of available supplies from domestic prdoucers.

Stocks of refined copper in the hands of fabricators on May 1 totaled 358,243 tons, representing a decline from 381,107 tons on Apr. 1. Stocks totaled 354,992 tons on Jan. 1.

Actual consumption of copper in April amounted to 124,032 tons, an increase of about 17,400 tons and the highest since October, 1948. Primary copper producers and custom smelters delivered 101,729 tons of refined copper to the fabricators during April, so that consumption exceeded fabricators' receipts by 22,303 tons. Unfilled orders on fabricators' books on May 1 totaled 196,399 tons, a decrease of 4000 tons.

Lead Demand Slackening

New York—Lead supplies are not as tight as other major nonferrous metals and demand has slackened slightly compared with that experienced earlier in the month. Bookings for delivery this month are close to a record high total. Prices are unchanged on the basis of 11.80c, St. Louis, for the common grade.

Tin Advances to 78.50c

New York—Tin prices advanced steadily during the early part of last week, reaching a level around 78.50c for spot delivery. Advances here followed the posting of higher prices in Singapore and London.

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 20.50c, Conn. Valley; Lake 20.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.00-19.25c; 88-10-2 (No. 215) 26.25c; 80-10-10 (No. 305) 22.75c; No. 1 yellow (No. 405) 16.25-17.00c.

Zinc: Prime western 12.50c; brass special 12.75c, intermediate 13.00c, East St. Louis; high grade 13.60c, delivered.

Lead: Common 11.80c; chemical 11.90c; corroding 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.50c, pigs 16.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 17.50c; No. 12 foundry alloy (No. 2 grade) 16.75-17.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00-18.25c; grade 2, 17.25-17.50c; grade 3, 16.00-16.50c; grade 4, 15.25-16.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot del., 78.50c; June del. 78.25c; July del. 78.12½c; Aug. del. 78.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%: Chinese and Yugoslavian, 22.00c; English and Belgian, prompt, 23.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $70-$73 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-99%, $1.80 per lb for 550 lb (keg); $1.80 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $66-$69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 20.50-cent copper.)

Sheet: Copper 35.43; yellow brass 32.03; commercial bronze, 95%, 35.36; 90%, 34.88; red brass, 85% 33.89; 80%, 33.42; best quality, 32.90; nickel silver, 18%, 45.21; phosphor-bronze, grade A, 5% 53.17.

Rods: Copper, hot-rolled 31.28; cold-drawn 32.53; yellow brass free cutting, 26.43; commercial bronze, 95% 35.05; 90% 34.57; red brass 85% 33.58; 80% 33.11.

Seamless Tubing: Copper 35.47; yellow brass 35.04; commercial bronze 90% 37.54; red brass 85% 36.80; 80% 36.33.

Wire: Yellow brass 32.32; commercial bronze, 95% 35.65; 90% 35.17; red brass, 85% 34.18; 80% 33.71; best quality brass 33.19.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 24.67, l.c.l. 25.17, 100,000 lb lots 24.545; weatherproof, f.o.b. eastern mills, c.l. 26.60, l.c.l. 27.10, 100,000 lb lots 26.35; magnet, del., 15,000 lb or more 30.50, l.c.l. 31.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	27.4	...	...
0.135-0.096	12-48	27.9	...	...
0.095-0.077	12-48	28.4	26.5	30.1
0.076-0.061	12-48	29.0	26.7	30.3
0.060-0.048	12-48	29.2	26.9	30.6
0.047-0.038	12-48	29.6	27.1	30.9
0.037-0.030	12-48	30.0	27.5	31.4
0.029-0.024	12-48	30.4	27.8	31.8
0.023-0.019	12-36	31.0	28.2	32.3
0.018-0.017	12-36	31.6	28.8	33.1
0.016-0.015	12-36	32.3	29.4	34.0
0.014	12-24	33.2	30.2	35.1
0.013-0.012	12-24	34.1	30.9	36.0
0.011	12-24	35.1	31.8	37.2
0.010-0.0095	12-24	36.1	32.8	38.5
0.009-0.0085	12-24	37.3	33.9	40.0
0.008-0.0075	12-24	38.6	35.1	41.6
0.007	12-18	40.0	36.4	43.4
0.006	12-18	41.5	37.7	47.5

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— 17S-T4
0.125	48.5	....	....
0.156-0.203	41.5	....	....
0.219-0.313	38.5	....	....
0.344	37.5	....	47.5
0.375	37.0	46.0	44.5
0.406	37.0	....	....
0.438	37.0	46.0	44.5
0.469	37.0	....	....
0.500	37.0	46.0	44.5
0.531	37.0	....	....
0.563	37.0	....	42.0
0.594	37.0	....	....
0.625	37.0	43.5	42.0
0.656	37.0	....	....
0.688	37.0	....	42.0
0.750-1.000	36.0	41.0	39.5
1.063	36.0	....	38.0
1.125-1.500	35.0	39.5	38.0
1.563	35.0	....	37.0
1.625	34.0	....	37.0
1.688-2.000	34.0	....	....
2.125-2.500	33.0	....	....
2.625-3.375	32.0	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends; List price plus 45%.

ZINC

Sheets, 18.25c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 17.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 16.50c; over 12-in., 17.50c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled, 66.00c. Rods and shapes, 56.00c, Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb. 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 32.09c; oval 30.59c; cast 28.87½c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 46.50c, under 1000 lb 48.50c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl. 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 94.00c, 500 to 999 lb, 94.5c; 200 to 499 lb, 95.00c; less than 200 lb, 96.5c, ball, 1000 lb and over, 96.25c; 500 to 999 lb, 96.75c; 200 to 499 lb 97.25c; less than 200 lb, 98.75c, f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 59.7c, 100 or 300 lb drums only, 100 to 500 lb, 51.4c; 600 to 1900 lb, 49c; 2000 to 9900 lb, 47.3c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 42.00c, 10 or more drums 40.00c, f.o.b. Niagara Falls, N. Y.; 43.25c and 41.25c, respectively, del. Cleveland or Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 85.70; more than 2000 lb, 83.70c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 72.29c; 100 lb kegs 73.29c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Heavy Clean	Ends Rod	Turnings Clean
Copper	17.50	17.50	16.75
Yellow Brass	14.625	14.375	13.375
Commercial Bronze			
95%	16.50	16.25	15.75
90%	16.375	16.125	15.625
Red brass			
85%	16.00	15.75	15.25
80%	15.75	15.50	15.00
Best Quality(71-80%)	15.375	15.125	14.625
Muntz metal	13.50	13.25	12.75
Nickel, silver, 10%	16.375	16.125	8.18¾
Phos. bronze, A	17.75	17.50	16.50
Naval brass	13.875	13.625	13.125
Manganese bronze	13.875	13.625	13.00

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 17.25; No. 2 copper 16.25; light copper 15.25; composition red brass 14.50-14.75; radiators 11.25-11.50; heavy yellow brass 11.00-11.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 17.25; No. 2 copper 16.25; light copper 15.25; refinery brass (60% copper) per dry copper content 16.00-16.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 15.75-16.00; No. 2 14.75-15.00; light copper 13.75-14.00; No. 1 composition red brass 12.75-13.00; No. 1 composition turnings 12.25-12.50; mixed brass turnings 8.00-8.25; new brass clippings 12.50-13.00; No. 1 brass rod turnings 11.00-11.50; light brass 7.75-8.00; heavy yellow brass 8.75-9.00; new brass rod ends 11.25-11.75; auto radiators, unsweated 9.75-11.00; cocks and faucets, 10.75-11.00; brass pipe 11.25-11.50.

Lead: Heavy 9.50-9.75; battery plates 5.25-5.50; linotype and stereotype 11.50-11.75; electrotype 9.75-10.00; mixed babbitt 9.75-10.00.

Zinc: Old zinc 6.00-6.25; new die cast scrap 6.00-6.25; old die cast scrap 4.25-4.50.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00; No. 1 babbitt 30.00-32.00.

Aluminum: Clippings 2S 11.00-11.50; old sheets 8.00-8.50; crankcase 8.00-8.50; borings and turnings 5.00.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 24-26	20.50	11.80	12.50	78.50	17.50	25.50	40.00	72.75
May 23	20.50	11.80	12.00	78.375	17.50	24.50	40.00	72.75
May 22	20.50	11.80	12.00	78.25	17.50	24.50	40.00	72.75
May 19-20	20.50	11.80	12.00	77.50	17.50	24.50	40.00	72.75
May 18	20.50	11.80	12.00	77.375	17.00	24.50	40.00	72.75
May 17	20.50	11.80	12.00	77.50	17.00	24.50	40.00	72.75
May 15-16	19.50	11.80	12.00	77.375	17.00	24.50	40.00	72.75
May 11-13	19.50	11.80	12.00	77.625	17.00	24.50	40.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, May 25, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

May 25	$35.50
May 18	33.83
Apr. 1950	29.40
May 1949	22.29
May 1945	19.13

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	*$39.00§*
No. 2 Heavy Melt.	*33.00-34.00*
No. 1 Busheling	*39.00§*
No. 1 Bundles	39.00
No. 2 Bundles	*30.00**
No. 3 Bundles	27.00-27.50*
Heavy Turnings	34.50-35.00
Machine Shop Turnings	*28.00-28.50†*
Mixed Borings, Turnings	*28.00-28.50†*
Short Shovel Turnings	*30.00*
Cast Iron Borings	*27.50-28.00*
Low Phos. Steel	*42.00-43.00*

Cast Iron Grades

No. 1 Cupola Cast	37.00-38.00
No. 1 Machinery Cast	41.00-42.00
Charging Box Cast	37.00-38.00
Heavy Breakable Cast	33.50-34.50

Railroad Scrap*

No. 1 R.R. Heavy Melt.	40.00-40.50‡
Rails, Random Lengths	40.00-41.00
Rails, 2 ft. and under	42.50-43.00
Rails, 18 in. and under	*44.00-44.50*
Railroad Specialties	*43.00-44.00*
Axles	38.00-39.00
Angles, Splice Bars	41.00-42.00*

* Nominal.
† Crushers' buying prices.
‡ Brokers' buying prices.
§ Brokers paying $40.

CLEVELAND

No. 1 Heavy Melt. Steel	*$35.00-35.50*
No. 2 Heavy Melt. Steel	32.00-32.50
No. 1 Busheling	*35.00-35.50*
No. 1 Bundles	*35.00-35.50*
No. 2 Bundles	28.50-29.00
Machine Shop Turnings	23.00-23.50
Mixed Borings, Turnings	*26.00-26.50*
Short Shovel Turnings	*26.00-26.50*
Cast Iron Borings	*26.00-26.50*
Low Phos.	*36.00-36.50*

Cast Iron Grades

No. 1 Cupola	*46.00-46.50*
Charging Box Cast	*40.50-41.50*
Stove Plate	*38.00-39.00*
Heavy Breakable Cast	*35.00-35.50*
Unstripped Motor Blocks	*33.50-34.50*
Brake Shoes	*31.50-32.50*
Clean Auto Cast	*46.50-47.50*
No. 1 Wheels	*39.50-40.00*
Burnt Cast	*35.50-36.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-40.00
R.R. Malleable	*43.00-44.00*
Rails, 3 ft and under	*44.00-45.00*
Rails, 18 in. and under	*46.00-47.00*
Rails, Random Lengths	*41.00-42.00*
Cast Steel	*37.00-38.00*
Railroad Specialties	*38.00-38.50*
Uncut Tires	*39.00-40.00*
Angles, Splice Bars	*43.50-44.00*

VALLEY

No. 1 Heavy Melt. Steel	*$38.50-39.00*
No. 2 Heavy Melt. Steel	35.00-35.50
No. 1 Bundles	*38.50-39.00*
No. 2 Bundles	30.50-31.00
Machine Shop Turnings	*27.00-27.50*
Short Shovel Turnings	*29.00-29.50*
Cast Iron Borings	*29.00-29.50*
Low Phos.	*39.00-39.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.50-39.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$32.50*
No. 2 Heavy Melt. Steel	*30.00-30.50*
No. 1 Busheling	*31.50*
No. 1 Bundles	*32.50*
No. 2 Bundles	*27.00*
Machine Shop Turnings	*22.00*
Short Shovel Turnings	*24.00*
Mixed Borings, Turnings	*20.00-21.00*
Low Phos. Punchings and Plate, elec. fur. grade	*36.00-37.00*
Low Phos. Plate, 5 ft & Under	*36.00-37.00*
Elec. Furnace Bundles	*33.50*
Heavy Turnings	*32.50*
No. 1 Chemical Borings	30.00
Knuckles and couplers	*37.00*
Steel car wheels	*37.00*

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
No. 1 Machinery Cast	*39.00-40.00*
No. 1 Yard Cast	*34.00-35.00*
Charging Box Cast	36.00
Heavy Breakable Cast	36.00
Unstripped Motor Blocks	29.00
Clean Auto Cast	*39.00-40.00*
No. 1 Wheels	41.00
Malleable	*33.00-34.00*

CINCINNATI

No. 1 Heavy Melt. Steel	*$33.50*
No. 2 Heavy Melt. Steel	*29.00*
No. 1 Busheling	*33.50*
No. 1 Bundles	*33.50*
No. 2 Black Bundles	*28.00*
No. 3 Bundles	*24.00*
Machine Shop Turnings	18.00
Short Shovel Turnings	21.00
Mixed Borings, Turnings	20.00
Cast Iron Borings	21.00

Cast Iron Grades

No. 1 Cupola Cast	45.00
Charging Box Cast	36.00
Stove Plate	*33.00*
Heavy Breakable Cast	*38.50*
Unstripped Motor Blocks	27.00
Brake Shoes	*26.00*
Clean Auto Cast	45.00
Drop Broken Cast	46.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	*35.00*
R.R. Malleable	*41.00*
Rails, Rerolling	*45.00*
Rails, Random Lengths	40.00
Rails, 18 in. and under	48.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$26.50-27.50*
No. 1 Bundles	*36.50-37.50*
No. 2 Bundles	*25.00-25.50*
No. 1 Busheling	*36.00-36.50*
Machine Shop Turnings	*20.50-21.00*
Forge Flashings	*34.50-35.00*
Short Shovel Turnings	*23.50-24.00*
Cast Iron Borings	*23.50-24.00*
Punchings & Plate Scrap	*37.00-37.50*

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00
Heavy Breakable Cast	33.00-34.00
Clean Auto Cast	43.00-44.00

BUFFALO

No. 1 Heavy Melt. Steel	*$34.00-35.00*
No. 2 Heavy Melt. Steel	*31.00-32.00*
No. 1 Bushelings	*31.00-32.00*
No. 1 Bundles	*32.00-33.00*
No. 2 Bundles	*30.00-31.00*
Machine Shop Turnings	22.50-23.00
Mixed Borings, Turnings	25.50-26.00
Cast Iron Borings	25.50-26.00
Short Shovelings	26.00-26.50
Low Phos.	*36.00-37.00*

Cast Iron Grades

No. 1 Machinery	38.00-38.50
No. 1 Cupola	35.50-36.00
Stove Plate	33.50-34.50
Malleable	34.50-35.00

Railroad Scrap

Rails, 2 ft. and under	38.00-39.00
Scrap rails	35.00-35.50
Specialties	35.00-36.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$29.00-29.50*
No. 2 Heavy Melt. Steel	*24.00-24.50*
No. 1 Busheling	*26.00-26.50*
No. 1 Bundles	*29.00-29.50*
No. 2 Bundles	*22.00-22.50*
Machine Shop Turnings	*16.50-17.00*
Mixed Borings, Turnings	*16.50-17.00*
Short Shovel Turnings	*18.50-19.00*
Punchings & Plate Scrap	*29.00-29.50*
Low Phos. Plate, 5 ft & under	*29.00-29.50*
Elec. Furnace Bundles	*29.00-29.50*

Cast Iron Grades

No. 1 Cupola Cast	28.00-28.50
No. 1 Machinery	29.50-30.50
Charging Box Cast	29.00-30.00
Heavy Breakable	29.00-30.00
Unstripped Motor Blocks	22.00-22.50
Malleable	35.50

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$26.50-27.00*
No. 2 Heavy Melt. Steel	*22.50-23.00*
No. 1 Bundles	*26.50-27.00*
No. 1 Busheling	25.00-26.00
Machine Shop Turnings	15.50-16.00
Mixed Borings, Turnings	15.50-16.00
Short Shovel Turnings	18.00-18.50
Bar Crops and Plate	*28.00-29.00*
Punchings & Plate Scrap	*28.00-29.00*
Chemical Borings	19.50-20.00

Cast Iron Grades

No. 1 Cupola Cast	*30.00-32.00*
Mixed Cast	*28.00-29.00*
Heavy Breakable Cast	26.50-27.50
Stove Plate	25.00-26.00

CHICAGO

No. 1 Heavy Melt. Steel	*$35.00*
No. 2 Heavy Melt. Steel	*33.00*
No. 1 Bundles	*35.00*
No. 2 Bundles	*31.00*
Machine Shop Turnings	*23.00-24.00*
Mixed Borings, Turnings	*23.00-24.00*
Short Shovel Turnings	*25.50-27.00*
Cast Iron Borings	*26.00-27.00*
Low Phos.	*39.00-40.00*
Elec. Furnace Bundles	*35.00*
Heavy Turnings	26.00-27.00
Cut Structurals	35.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	*46.00-47.00*
Clean Auto Cast	*46.00-47.00*
No. 1 Wheels	*38.00-39.00*
Stove Plate	*37.00-38.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	36.00-37.00
Malleable	*44.00-45.00*
Rails, Rerolling	*49.00-50.00*
Rails, Random Lengths	*40.00-41.00*
Rails, 2 ft and under	*46.00-47.00*
Rails, 18 in. and under	*47.00-48.00*
Railroad Specialties	*39.00-40.00*
Angles, Splice Bars	*41.00-42.00*

BIRMINGHAM

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	25.00
No. 2 Bundles	22.00
Machine Shop Turnings	19.50
Mixed Borings, Turnings	17.00
Short Shovel Turnings	23.00
Cast Iron Borings	19.00
Bar Crops and Plate	28.00-29.00
Cut Structurals	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
Stove Plate	30.00-31.00
No. 1 Wheels	30.50-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00-28.00
R.R. Malleable	nominal
Rails, Rerolling	33.00-35.00
Rails, 3 ft and under	36.00
Angles and Splice Bars	35.00-36.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*$34.00-35.00*
No. 2 Heavy Melt. Steel	*31.00-32.00*
Machine Shop Turnings	*20.00-21.00*
Short Shovel Turnings	*23.00-24.00*

Cast Iron Grades

No. 1 Cupola Cast	39.00-41.00
Charging Box Cast	*34.00-35.00*
Heavy Breakable Cast	*33.00-34.00*
Brake Shoes	34.00-35.00
Clean Auto Cast	39.00-41.00
Burnt Cast	33.00-34.00

Railroad Scrap

R.R. Malleable	36.00-37.00
Rails, Rerolling	48.00-50.00
Rails, Random Lengths	38.00-39.00
Rails, 3 ft and under	*42.00-43.00*
Uncut Tires	*37.00-38.00*
Angles, Splice Bars	39.00-41.00
Railroad Specialties	39.00-40.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	13.00
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	15.50
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	12.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	27.50-30.00
Cut Structurals	27.50-30.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-30.00
Heavy Breakable Cast	25.00
Stove Plate	25.00
Unstripped Motor Blocks	23.00
Malleable	25.00
Brake Shoes	23.00
Clean Auto Cast	25.00-30.00
No. 1 Wheels	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	19.00
Railroad Malleable	25.00
Rails, Random Lengths	19.00
Angles and Splice Bars	19.00

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(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	5.00
Mixed Borings, Turnings	5.00
Punchings & Plate Scrap	26.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	30.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$27.00
No. 1 Bundles	27.00
Mechanical Bundles	25.00
Mixed Steel Scrap	23.00
Mixed Borings, Turnings	20.00
Rails, Remelting	27.00
Rails, Rerolling	30.00
Busheling	21.50
Bushelings new factory, prep'd	25.00
Bushelings new factory, unprep'd	20.00
Short Steel Turnings	20.00

Cast Iron Grades

Cast	40.00-43.00*

* F.o.b. shipping point.

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Sheets Strip . . .

Sheet and Strip Prices, Page 95 & 96

Cold-rolled sheet producer advances prices. Supplies of sheet bars tightening

Pittsburgh—Pressure continues for deliveries throughout entire classification range of sheet and strip products. Sellers are expected to ration output throughout third quarter and most anticipate full production schedules through remainder of the year. Active participation in conversion tonnage commitments for periods 3 to 4 months ahead indicates consumers' views as to demand-supply relationship during this period.

Follansbee Steel Corp., Pittsburgh, advanced cold-rolled sheet prices $20 a ton to the basis of $5.10 per 100 lb, Follansbee, W. Va. The company also increased the differential over cold-rolled sheet base from $1 to $1.25 per 100 lb for blued stove sheets, or $5 per ton.

Some hand mill operators are booked into October on galvanized and plain hot-rolled pickled sheets, at prices ranging from $140 to $150 a ton on hot-rolled and $160 to $180 a ton for galvanized.

Superior Steel Corp., Carnegie, Pa., has increased cold-rolled deoxidized copper clad strip on one side from 20.00c to 20.35c per pound; both sides clad from 24.25c to 24.95c per pound, effective May 22. The hot-rolled grades were increased to 16.85c per pound for one side clad; both sides clad, to 21.70c.

Continued unusually heavy steel demand for electrical appliances is indicated by fact June production schedules at Westinghouse Electric Corp.'s Mansfield, O., plant will not be reduced on any product line despite anticipated normal summer lull in purchases at retail level. Company reports output of washers and driers in first five months this year will approximate 225 per cent above that recorded in like 1949 period.

Cleveland — With sheetmakers booked through third quarter there is little prospect for any relief in tight supply conditions. Rolling facilities will be engaged pretty much through the summer catching up on back orders. Consumers are turning increasingly to the conversion and gray markets though resistance to premium prices still is in evidence. Prices in the standard market are firm and reports are heard of isolated advances. Last week a Pittsburgh maker was reported quoting cold-rolled sheets $20 per ton higher. It also was said to have raised blued oven sheets $5. At the same time one nonintegrated producer was reported basing its sheet prices on the price it paid for scrap purchased for conversion ingot production.

Boston — Carbon sheets, notably lighter gages of cold-rolled, are scheduled well into third quarter. Specialties also are in strong demand. Inventories are being accumulated slowly. Automotive, tin plate and building industries are taking so large a volume of flat-rolled products, tonnage remaining for miscellaneous industrial users is limited. In connection with building, affiliated suppliers account for a large share; household appliance orders are appearing in unit lots.

New York—No easing is reported in general demand for sheets. In some scattered lines there is perhaps not the urgency, but in others consumers are ordering as much as they can get and want still more. Mills have little to offer for third quarter. Some, who are on a monthly allocation basis, have not opened books for September, but there is apparently more than enough tonnage in prospect to absorb the schedules once action is taken.

Philadelphia—Sheet consumers have been advised by some mills a portion of their tonnage originally placed for third quarter in all probability will not be available until fourth quarter.

Cincinnati—Work in district sheet mills on third quarter schedules indicate supplies will continue tight. Demand is broad with no slackening in any sheet consuming area.

Chicago—Some large sheet consumers scheduled closings over Memorial Day weekend and notified steel producers not to ship.

Sheets are more sorely needed for production than at any time since the war. Observers believe no steel is going into inventory. Increasing dependence is placed on gray market material. Some users will pay premiums of upwards of $50 a ton for prompt shipment.

Many gray market operators are trying to sell material they do not have. Here's how it works: A broker offers to set the prospective buyer up in an arrangement with a mill named by the broker. Client is then directed to approach the mill directly and for any steel he obtains over a given period he pays the broker a flat commission (in one case $12 a ton). The arrangement the broker claims to make with the mill is fictitious, but any steel the client gets from that mill later because of decline in overall steel demand comes under the contract and the broker's commission still must be paid.

Numerous users, including farm equipment, home appliance, radio and television, construction machinery makers, state they would increase production schedules substantially if steel were available. Some report 25 per cent of their requirements coming from irregular channels.

Makers of conventional washing machines report automatics are biting deeply into the market. Some are reducing production schedules. Deluxe stoves are reported not moving well and makers with lower price lines are diverting steel to them.

Birmingham—Sheet supplies are tight. Mills are behind on shipments and indications are there will be sizable carryover into third quarter.

Los Angeles — Worsening supply situation in flat-rolled products is causing fabricators to accept small lots of Belgian steel. Quality is good; prices, $20-$28 less than domestic mill prices. Delivery is six to eight weeks on sheet and hot-rolled strip.

San Francisco—Fabricators, large and small, are scrambling for sheet supplies and finding metal scarcer each day. There's no sign the critical tightness will be relieved soon.

Steel Bars . . .

Bar Prices, Page 95

Cleveland—Further tightening in bar supplies is noted with consumers having increasing difficulty in satisfying needs. Some manufacturing operations are hampered by shortages. Stringency is chiefly felt in hot-rolled carbon bars, but cold-finished deliveries extend well into summer and alloy bars are less freely available than they were a month or so back. One of the principal reasons for the shortage of bars is the fact there isn't sufficient semifinished steel to keep the bar mills fully engaged.

Boston—Supplies of hot-rolled carbon bars available for fourth-quarter delivery are limited, but some orders have been tentatively accepted. Consumers are more cautious in making commitments beyond third quarter. Moderate decline in end-use operations is expected during summer. Part of third-quarter buying has been for stock.

New York—Further tightening is noted in hot carbon bars. Some sellers are sold up through August and have good backlogs into September. There is increasing disposition to sell on a monthly allocation basis. Some mills have been doing it for some time. Demand is widely diversified. Increased requirements from machine tool builders and heavier railroad buying are important factors. There is no let-up in automotive requirements.

Philadelphia—There is further acceleration in hot carbon bar business, reflected in extended deliveries at the mills. Some producers now have little tonnage to offer before September.

Los Angeles — Although bar requirements are firmer and users are specifying more heavily, supplies remain adequate. Bethlehem deliveries are virtually current with demand, while Columbia Steel Co. is quoting June shipments.

Wire . . .

Wire Prices, Page 97

Birmingham—Third quarter carryover wire tonnage will be substantial. Mills are producing most wire items at capacity rate.

Semifinished Steel . . .

Semifinished Prices, Page 95

Pittsburgh—Hand sheet mills report growing tightness in sheet bar supplies.

Prices range from $61 to $82 per ton, representing an advance of $7 per ton within the last month on the upper side of the range. One supplier has discontinued sale of sheet bars to other than its own subsidiaries. Hand mill operators report increasing tonnage of sheet bars offered by French and Belgian producers, delivered at $5 to $10 a ton below domestic prices and within three weeks after cabling specifications. One nonintegrated producer has made commitments for foreign sheet bar tonnage equivalent to about 45 per cent of requirements.

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Structural Shapes . . .

Structural Shape Prices, Page 95

Fabricators' backlogs increasing and mill deliveries are steadily lengthening

Philadelphia—Structural shops report further increase of backlogs, especially for bridge work. Shape mills have little plain material for shipment against new contracts before late August.

April structural bookings, according to American Institute of Steel Construction, totaled 150,542 tons, against revised totals for March, February and January of 189,420 tons, 117,664 tons and 119,317 tons, respectively. Total for the first four months is 576,943 tons, compared with 487,063 tons in corresponding period last year.

April shipments amounted to 155,072 tons, against revised totals for March, February and January of 156,781 tons. 129,628 tons and 135,250 tons, respectively. Total shipments for first four months are 576,734 tons, against 663,716 tons in same period of 1949.

Both bookings and shipments show an increase of greater than 30 per cent over the average for the same period in prewar years, 1936 through 1940.

Backlog for the next four months only stands at 540,213 tons, against 628,111 tons as of May 1, 1949.

New York—While bridge work still dominates the structural market, award has been made of a 3900-ton office building for Dun & Bradstreet, Church street, and bids have gone in on approximately 6000 tons for a 38-story addition to the Chrysler Bldg. here. Bids also have gone in on a 1350-ton Junior high school in the Bronx. Shape deliveries have undergone further expansion; some leading sellers have nothing to offer before September on standard sections. In general, wide flange sections are more extended than standard, although one large interest can book a little tonnage in August, whereas it has nothing before September in standard forms.

Boston — Despite relatively high volume of fabricated structural steel business estimated, prices are competitive and soft. Most recent increase in plain material prices has never been reflected in fabricated steel quotations.

Cleveland—Substantial volume of work is before the market, chiefly jobs involving 50 to 200 tons. Competition among fabricators is severe but price shading on fabricated work is less in evidence than a few weeks back. Some fabricators are buying imported steel at prices under domestic market levels. Importers are offering six weeks delivery from Europe and, with the increasing shortage of steel, their offers are receiving increasing attention.

Chicago—Institution and apartment building are of most importance to fabricators. Less bridge and public work than was anticipated has materialized. Power plant construction is downgrade. Shops are occupied but the stiff price competition continues. Steel supply is more of a worry, mill deliveries becoming progressively more extended. A few shops say jobs are being held up for lack of specific steel items.

Birmingham — Moderate improvement in demand for shapes is evident here, although the plumbers' strike, in its sixth week, has disrupted building plans.

San Francisco—Public works and increasing private construction are keeping demand for structural shapes steady. Supplies are readily available except for wide flange beams.

Seattle—Local fabricators have a 60-day order backlog. Over-the-counter business continues in good volume. Several projects calling for shapes are up for bids to the Bureau of Reclamation and U. S. engineers.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 95

Boston — Demand for reinforcing bars holds at high level, with housing projects bringing out additional volume to bolster active highway and bridge inquiry. As with fabricated structural steel, reinforcing bars are under price pressure. Contractors generally quote 9.00c to 10.00c per pound for bars in place.

Los Angeles—Market for reinforcing bars is tightening. Rolling mills, operating close to capacity, are keeping supplies current with demand. Construction of a $2.5 million building for the University of Southern California School of Dentistry will start this fall.

Seattle—Rolling mills report a good volume of new business in lots of less than 100 tons each. Reinforcing bar tonnage exceeds that of merchant bars. Northwest Steel Rolling Mills, Inc., Seattle, is rolling five days a week, two shifts.

Plates . . .

Plate Prices, Page 95

Boston—Heavier order backlogs and more extended deliveries from eastern mills are diverting some tonnage to producers in Pittsburgh and other areas. Volume of plate demand for making small tanks for underground installation holds beyond expectations and miscellaneous needs are sustained. Bulk of orders are for lighter gages with buyers more inclined to place volume beyond nearby commitments. Large diameter pipe inquiry has slackened, but some tonnage remains to be bought for the Metropolitan District Commission, this city. Heavier freight car requirements also are lengthening deliveries.

New York—Oil storage tank business continues to expand. In addition to seasonal activity in fabrication of small underground fuel oil storage tanks, a pick-up is noted in fabrication of larger above-ground tanks. Four orders for these larger tanks are reported here involving a total of 14,048 tons. Plate mill backlogs are undergoing further expansion, due primarily to tank work, line pipe construction and railroad car building and repair programs. Virtually all mills are booked well into third quarter on heavier gages, ½ inch and over; some, practically through the third quarter on the lighter gages.

Philadelphia—Plate market is featured by continued heavy specifications for light gage material primarily for fuel oil tanks, fabricated pipe and railroad equipment.

Consumers miss the strip plate capacity available during and immediately after the war. Little tonnage is now being rolled on strip mills because of extreme pressure for sheets and strip.

Birmingham—Plates are tightening gradually. While it is not likely the district will share in car orders for more than a relatively few off-line railroads, orders such as the 10,000-cars for the Pennsylvania affect the overall situation. Pullman-Standard is not adequately supplied with plates and general needs are widespread.

Los Angeles — Mounting pressure from pipeline commitments is causing producers to divert still more production to pipe. Plate production of Geneva Steel Co. is now on allocation. Columbia Steel Co.'s plate books are filled through July. Fabricators are scheduling production carefully to extended plate deliveries.

San Francisco—Demand continues to increase and supplies are tightening. Eastern tonnage is scarce.

Diamond Alkali Revises Prices

Cleveland—Diamond Alkali Co. will increase prices of chlorine, soda ash and caustic soda, effective July 1. Increases will be $2 a ton in carload prices of light and dense soda ash and $3 a ton in carload prices of liquid, solid and flake caustic soda.

The new price on liquid chlorine in single-unit tank cars will be $2.55 per hundredweight. Prices on multi-unit tank car shipments, in ton containers, for an annual period, to contract customers and only to one destination, on a hundredweight basis, will be: 165 tons and more, $3.05; 105 tons to 165 tons, $3.25; 90 tons, $3.50; 75 tons, $3.75; 60 tons, $4; 45 tons, $4.50; 30 tons, $5; 15 tons, $6; 8 tons on special truck, $8.

All prices are f.o.b. Diamond's plants at Painesville, O.; Baldwin, Ark.; and Houston. Multi-unit tank cars are not available at Baldwin. All Edgewood, Md., chlorine prices are 10 cents per hundredweight higher than above.

Tool Steel . . .

Tool Steel Prices, Page 97

Pittsburgh—Continued high level of metalworking activity, notably within the automotive industry, is reflected in steady demand for tool steels at a rate substantially in excess of that recorded a year ago. However, most grades generally are still available from stock and producers' production schedules remain well below capacity which was materially augmented throughout the war period.

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Tubular Goods . . .

Tubular Goods Prices, Page 98

Large amount of building construction reflected in active demand for merchant pipe

New York—Merchant pipe demand is active, reflecting particularly the heavy amount of building construction. Distributors have stocks in fair balance, but are taking full mill allotments in virtually all instances. Some local mill representatives look for an easing in buttweld pipe requirements by mid-summer, but anticipate a brisk demand for seamless pipe throughout the greater part of the year. Public utilities are expected to specify freely for some time. Meanwhile, there is tentative estimating of requirements by lower New England gas companies as to lead-off requirements from the large line scheduled to run into Boston from the Southwest. Requirements for this line and its branches have been covered up to the eastern New York border.

While merchant pipe requirements, as well as oil and gas line needs, are active, boiler and mechanical tubing demand lags.

Beaver Falls, Pa.—New data card on carbon steel pipe has been issued by the Babcock & Wilcox Tube Co. TDC 135 tabulates present day prices per hundred feet of seamless carbon steel pipe 1-1½ in. in nominal diameter and smaller, in all quantity brackets. The card also indicates prices for standard weight (schedule 40), extra heavy weight (schedule 80), and double extra weight.

Los Angeles — Pressure for pipe items is increasing and mill supplies are trailing demand. Columbia Steel Co. generally is quoting September delivery. Plumbers' items and 2 to 4-in. seamless are currently in tight supply.

American Pipe & Construction Co., Los Angeles, has been awarded a $1.6 million contract for 9.6 miles of 48-in. conduit, to carry water to Santa Barbara from the Cachuma Reservoir. Construction of a $2.5 million sewer trunk line has been authorized by Orange county, California.

To follow closely the completion of the fabrication of the 1084-mile Trans-Arabian pipeline by Consolidated Western Steel Corp., Maywood, Calif., is another new pipeline contract. Fabrication of nearly 500 miles of large diameter steel pipe to be used as an international pipeline for the Iraq Petroleum Co. Ltd., London, England, will start in June. The new contract will require about 166,000 tons of high test expanded steel pipe, 30-32 in. in diameter. Every section of the new pipeline will be manufactured in the west.

Sharing in the contract is the National Tube Co., Pittsburgh, which will fabricate 92 miles of the pipeline.

San Francisco—New drilling activity in western oil fields continues restricted. In California plans have been filed for drilling 633 wells compared with 1074 notices filed up to this time last year. Rocky Mountain area drilling activity has declined 40 per cent.

Seattle—Inquiry for cast iron pipe is more active and several sizable projects are to be up for bids. In some instances awards hinge on delivery; agencies of eastern producers can deliver in 60 days while local interests can make delivery within two weeks.

Tin Plate . . .

Tin Plate Prices, Page 96

Pittsburgh—Tin plate production schedules are filled to the extent mills have opened books on forward commitments into the third quarter. First-half carryover tonnage is a factor in this connection. Sellers note increased pressure for deliveries with the approach of a heavy seasonal food pack program. Demand for black plate rejects is heavier and producers are experiencing no difficulty in moving waste-wastes. Output of electrolytic tin plate continues to exceed that of hot-dipped by a substantial margin. However, if more steel were available, the differences in tonnages would be narrowed somewhat to meet heavier coating requirements for certain food packs.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 98

Pittsburgh — Oven foundry coke output at Neville Island, Pa., will be maintained throughout the period of relining Pittsburgh Coke & Chemical Co.'s blast furnace. Demand continues active for oven foundry coke, but is somewhat depressed for Connellsville beehive foundry grades, as reflected in a drop of 50 cents a ton in the latter to a range of $15-$16. Prices for beehive furnace coke are firm.

Cleveland—Strong demand for oven foundry coke is reported by sellers. Foundry requirements have expanded in step with increased demand for castings. Casting shops have not been able to add much in the way of inventory. Price tone of the market is firm but talk of possible increases has faded to a whisper.

Ferroalloys . . .

Ferroalloy Prices, Page 99

Washington—Silicon alloy production in the United States increased 29 per cent in first quarter over the preceding quarter, reports Bureau of Mines. Production of silicon metal and all grades of silicon alloys totaled 147,733 net tons compared with 114,872 tons in fourth quarter, 1949.

Blast-furnace (silvery pig) output was 40,366 tons, or 27 per cent of the total; electric furnace production (14-95 per cent silicon) amounted to 95,387 tons, or 65 per cent; silicon metal, silicon briquets and miscellaneous silicon alloys amounted to 11,980 tons, or 8 per cent.

Shipments during first quarter from producing plants of blast-furnace silvery pig iron, electric-furnace ferrosilicon, and other silicon alloys were 48,557 tons, 108,377 tons and 14,256 tons, respectively, total of 171,190 tons. This compared with 27,766 tons, 81,290 tons, and 12,350 tons, respectively, during fourth quarter, 1949.

Apparent consumption of silicon alloys increased 41 per cent over the fourth quarter of 1949 and totaled 172,733 net tons.

Imports of ferrosilicon increased in first quarter to 1996 net tons, valued at $62,483 from 1816 tons, valued at $64,789 tons in last quarter of last year. Imports in first quarter contained 233 tons of silicon, an average of 12 per cent. Exports in first quarter amounted to 453 tons, valued at $54,646.

Iron Ore . . .

Iron Ore Prices, Page 99

Cleveland—Due to the unusually late opening of shipping on the Great Lakes coupled with a high rate of consumption, stocks of iron ore dropped 6,765,516 tons during April to only 14,099,250 tons on May 1, reports the Lake Superior Iron Ore Association. This compared with 17,802,854 tons on May 1, 1949.

Stocks at furnaces on May 1 amounted to 10,616,746 tons in the United States and 416,677 tons in Canada, while stocks on Lake Erie docks in the United States amounted to 3,065,827 tons.

Consumption of Lake Superior iron ore increased to 7,109,044 tons in April from 5,947,807 tons in March and compared with 7,321,856 tons in April, 1949. This brought total consumption for the first four months to 25,125,898 tons compared with 29,639,512 tons for the like 1949 period.

On May 1, there were 169 furnaces in blast and 14 idle in the United States, unchanged from a month previously and comparing with 175 and 10, respectively, a year ago. In Canada, 8 were in blast and 2 idle on May 1, 7 in blast and 3 idle on Apr. 1, and 9 in blast and 1 idle on May 1, 1949.

Shipments of Lake Superior iron ore totaled 2,522,990 tons in the week ended May 22 compared with 2,718,884 tons the like week a year ago. This brought cumulative shipments for the season to 6,211,415 tons compared with 17,161,579 tons for the like 1949 period. Decrease in shipments to United States ports alone amounts to 10,928,269 tons.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 98

Cleveland — Industrial fastener makers are meeting increasing difficulty in satisfying their steel requirements. With volume business exceeding expectations, demand for steel here is as great as at any time since the war. Increasing dependence on warehouse steel suppliers is noted. Some makers are taking imported steel which is available below domestic market levels.

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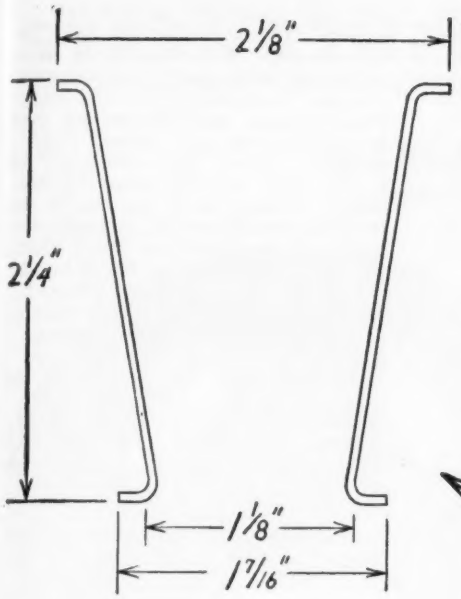
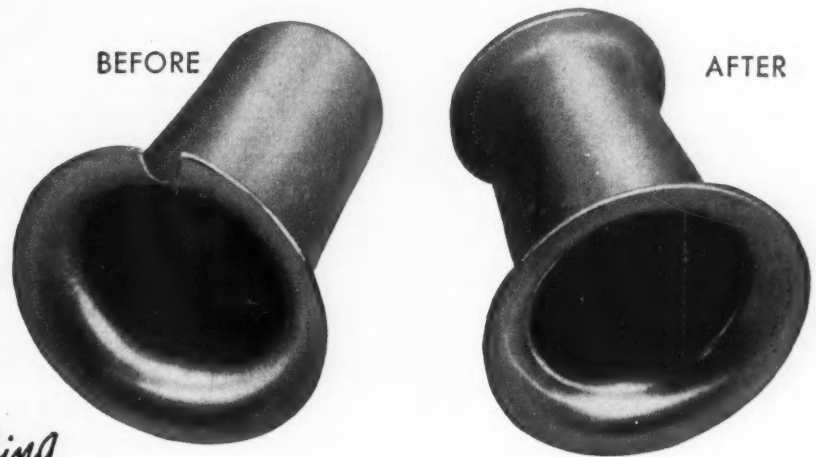


First they tried two makes of Type 304 Stainless Tubing, and got 50% rejects on the job.



Then they changed to Carpenter Stainless Tubing (Type 304) and eliminated the high cost of rejects and making more parts than were ordered.

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123 Springfield Road, Union, N. J.

Warehouse . . .

Warehouse Prices, Page 99

Distributors increase prices on various products $1 to $4 at number of points

Chicago — Prices from $1 to $4 higher per ton have been effected by district warehouses. Not affected are hot-rolled strip and cold-finished rounds. Standard structurals and plates increased the most, then cold-rolled sheets, hot-rolled sheets and bars and finally galvanized. Adjustments of prices in other centers take into account reduction in freight rates on 80,000 lb quantities to warehouses, a factor which is of little consequence to distributors who are located in the switching district here. The increases here, therefore, are not in all cases duplicated in other consuming districts.

Demand is unprecedentedly high at warehouses for flat-rolled, including plates, and appears to be mounting on structurals and specialties. Stainless supply has tightened, architectural applications having much to do with high level of present requirements.

Boston—Revised prices advanced some products from warehouse $4 per ton, including structurals, plates and floor plate, but hot-rolled strip and cold finished bars are lower, latter $2.20 per ton. Sheets are higher, but the increase is slight, $1 on cold-rolled and less for hot-rolled and galvanized.

Philadelphia — While prices have advanced anywhere from $2 to $4 a ton on some major items in certain adjacent districts, local distributors have not advanced their prices to date, other than to have made some adjustments in galvanized sheets due to advances in zinc. Some leading distributors report business as off a trifle from April; others claim their orders are about on a parity. Inventories are in good balance except in sheets. Supply of light flat-rolled products continues short of demand.

Pittsburgh—Price advances of $1 to $4 in galvanized, hot and cold-rolled sheets, shapes and plates put into effect by distributors in other districts have not spread to warehouse interests here. Demand for warehouse products has not been so brisk here as in other districts.

Baltimore—Warehouse prices here have been advanced 10 cents per hundred pounds on hot-rolled sheets and hot-rolled bars, 15 cents on cold rolled sheets and 20 cents on structural and floor plates. No action has been taken on junior beams, strip or cold-drawn bars. Similar increases are going into effect in Washington. Demand continues brisk; about on a parity with the April rate.

Cleveland—Distributors report demand pressure undiminished. Supplies are tightening throughout the range of products with extended mill deliveries forcing an increasing number of consumers to turn to warehouses for tonnage, especially light, flat-rolled items. Distributors' stocks of the latter, however, are limited and they are turning orders away. Warehouse prices are strong. Advances of $1 to $4 per ton were effected the past week on several products. Hot-rolled sheets were raised $2 per ton, cold-rolled sheets $3, galvanized sheets $1, structural shapes, plates and floor plates $4. Another increase on galvanized sheets is expected with the price of zinc still rising.

Cincinnati—Quotations on warehouse steel are higher. The new schedule is likewise an adjustment, the increase not being horizontal. Broad demand is making May one of the best months this year for sales which are at the expense of inventory. Sheets head the list of scarce material.

Los Angeles—Warehouse sales are steady at the April level. Demand has quickened for small angles, light channels, and small bar sizes. Distributors, by careful scrutiny of mill delivery dates, are generally keeping stocks in reasonable balance. Plate stocks, however, are being worn down by mounting consumer pressure and lengthening mill deliveries.

Seattle—Warehouses report normal turnover for this season, all out-of-stock items moving freely. Demand for sheets is strong. In some instances purchasers have to take off sizes. Cold-rolled sheets are extremely tight as output in this area is unequal to demand and eastern producers have no surplus for western areas. Distributors expect no relief until September, probably later.

Scrap . . .

Scrap Prices, Page 102

Pittsburgh—Absence of confirmed mill purchases adds to the confusion in at least temporarily establishing representative quotations on open-hearth grades to reflect obviously higher price levels. Scrap dealing among brokers appears to constitute principal activity with sales at $40 reported for old orders or in anticipation of still higher prices on June shipments. The mills admit large tonage commitments could not be made at $39 so it would seem the next representative purchase will be at $40 or higher.

Philadelphia—Western competition for steel scrap is causing district consumers to pay substantially higher prices on practically all open-hearth grades. The current market on No. 1 heavy melting steel and No. 1 bundles is $32.50, delivered, with the undertone strong. No. 2 heavy melting steel is $30-$30.50; No. 1 busheling, $31.50; and No. 2 bundles $27.00.

Short shovel turnings are higher at $24; machine shop turnings, $22; and mixed borings and turnings, $20-$21. The principal low phos grades are higher at $36-$37; electric furnace bundles, $33.50; and heavy turnings, $32.50. Knucklers and couplers and steel wheels are difficult to obtain at $37.

In the cast grades, No. 1 machinery and clean auto cast are higher at $39-$40; No. 1 yard cast, at $34-$35; and malleable, at $33-$34.

New York — Scrap brokers have again advanced buying prices on virtually all steel grades, as consumers' pressure is strong from the eastern Pennsylvania and Pittsburgh areas and collections are falling short of demand. They are offering $29-$29.50 f.o.b. shipping point for No. 1 heavy melting steel and No. 1 bundles, $24-$24.50 for No. 2 heavy melting steel, $26-$26.50 for No. 1 busheling and $22-$22.50 for No. 2 bundles.

Brokers also advanced their buying prices on machine shop turnings and mixed borings and turnings to $16.50-$17, on short shoveling to $18.50-$19 and on punchings and plate scrap and low phos plate, 5 ft and under, to $29-$29.50. Electric furnace bundles are now $29-$29.50. No change is noted in the cast grades, although the undertone is stronger.

Boston—Price differential between heavy melting steel, including bundles, and No. 2 and lighter grades is wider than usual, around $4 on heavy melting. Borings, turnings and lighter material is not showing the strength manifest in heavy scrap. Although demand for cast grades is limited, with outside buying slow, prices are firmer and slightly higher in spots.

Buffalo—Recent wide spread between scrap prices here and those in other steel centers has been narrowed. Business is reported in No. 1 heavy melting steel within a range of $34 to $35. Because of the drastic difference in prices compared with those elsewhere and the reluctance of dealers to accept additional orders at the old prices, ranges on No. 2 heavy melting and related steelmaking grades are $2 a ton higher. Even with these advances, the local market is still considerably below outside markets. Dealers caught with unfilled orders continue to incur heavy losses to obtain material to cover commitments.

Cleveland—Scrap prices continue to rise in this district. The market is supported by scattered sales to mills in the Valley and purchases by brokers to cover commitments. Bulk of old contracts will be fulfilled by the end of this month, indicating that mills will be forced to re-enter the market soon. The differential on No. 1 heavy melting steel prices over No. 2 has widened, the grades now being quoted $35-$35.50 and $32-$32.50, respectively. Mixed borings and turnings, short shoveling turnings and cast iron borings are 50 cents higher at $26-$26.50. Low phos is quoted $2 a ton higher at $36-$36.50.

Cast iron grades are $1 higher with No. 1 cupola quoted $46-$46.50.

The Valley mills have paid up to $39 for No. 1 heavy melting.

Detroit—With steel mills alarmed over how to stem a runaway market, prices leaped ahead again last week, some items as much as $4.50 per ton. Trading has an artificial character, as the old practice of earmarking has returned despite efforts to forestall it. Some large automotive lists turned out to be duds as the bulk of material scheduled for bids went back to mills on allocation. Conversion items like No. 1 bundles, busheling,

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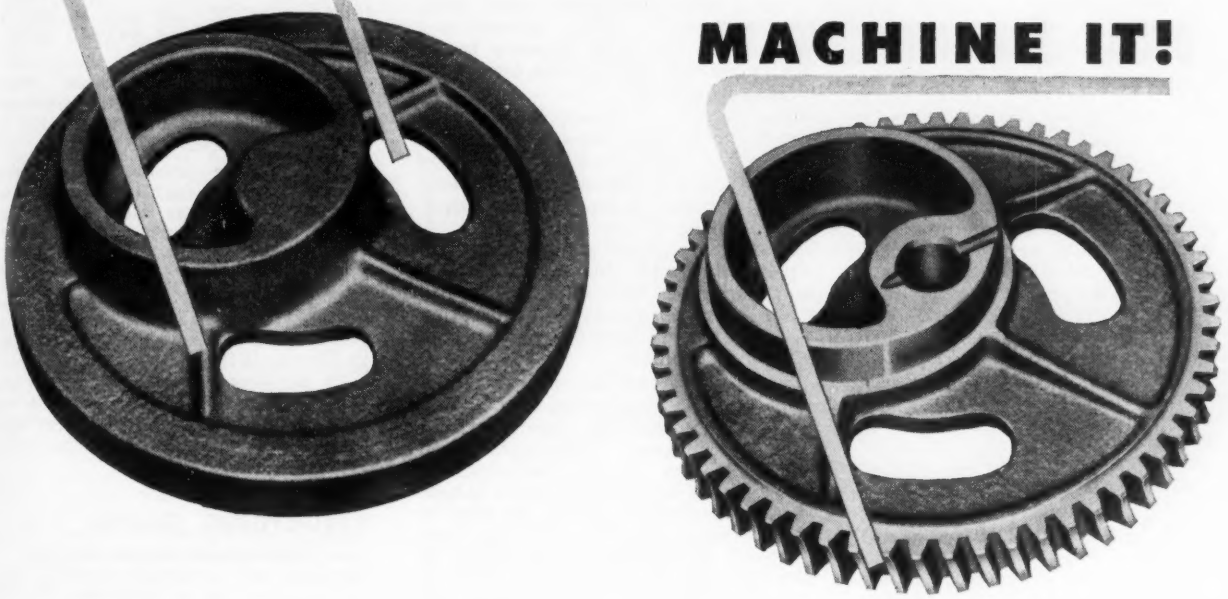

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These eccentric gears, used in a washing machine, illustrate a number of Gray Iron's outstanding advantages.

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plate and forge flashings are the hottest, while No. 2 grades are inclined on the "doggy" side, although still sentimentally strong. Brokers, mostly on the short side, take a gloomy view of the outlook, say they are in a real pinch.

Cincinnati—Scrap prices are moving upward with No. 1 heavy melting steel $33.50. An element in the rise is conversion buying. Dealers are bullish, although there is dearth of speculative holding and tonnage is coming out steadily. Some dealers are caught by the rapidly rising market with unfilled contracts.

Chicago—Heavy purchase of scrap by one mill here, estimated by some at 100,000 tons, failed to completely stabilize the market and brokers in some cases are paying as much as the mill price to cover. It is understood that the order consisted of one-third No. 1 heavy melting steel, one-third No. 2 heavy melting and one-third No. 2 bundles. Distributed in this fashion, it is giving traders a better chance to make up losses which may occur in buying the No. 1 steel, the other two grades being in reasonably good supply. Prices on all grades are stronger, the biggest increase being registered in foundry grades.

St. Louis—Steel scrap prices are $1 to $3 higher. Outside buying interest keeps the scrap market strong, even though demand from local consumers is lighter. Brokers here foresee a new price rise soon. Outside buying here is on a $32 basis for No. 2 melting. Shipments from remote points are picking up.

Birmingham—General strengthening is evident in scrap, although brokers are hesitant in raising prices until they can "survey the situation."

Los Angeles—Mills, buying lightly, are showing increased interest in specifications. Reporting a shortage of steelmaking scrap, dealers hope for increased mill purchases next month, but are eyeing northern markets speculatively.

San Francisco—Mills are in the market for sizable quantities at current prices. Big mill backlogs enable them to dictate price terms and no upward price boost is expected. Feature of the market here is continued active demand for No. 1 cupola cast.

Seattle — Strength of eastern scrap prices has not reacted on the local market. No. 1 heavy melting is still $18. Buying is limited, the largest steelmaker operating at only 40 per cent of capacity. Supply is ample, but not much material is coming from distant points, the bulk originating in western Washington.

Pig Iron . . .

Pig Iron Prices, Page 94

Philadelphia — Pig iron specifications are increasing, though some jobbing foundries are having difficulty maintaining a 4-day week. Specialty foundries, particularly pipe shops, are specifying freely. Basic is in heavy demand, although one district producer has switched from basic to foundry grades. General Steel Castings Co., Eddystone, Pa., suspended shipments last week due to a strike.

New York—Offerings of foreign iron are increasing. In certain instances under $35, duty paid, port, has been offered; however, it appears that some, if not all of these lower prices, are tied in with proposals involving other materials. Meanwhile, foreign iron generally is being offered at around $38, duty paid, port, for basic and foundry grades and around $39 for what appears to be the equivalent of American low phosphorus iron.

District foundry melt is only fair. Jobbing shops still have difficulty in getting operations up to four days a week and maintaining them for any length of time. Some specialty shops are operating at five days a week.

Boston—Foundry melt has not increased as much this spring as had been expected. Melt at textile equipment shops is steady. Consumption of basic iron is holding with foreign purchases a factor.

Cleveland—With the foundries entertaining noticeably heavier volume business, demand for merchant pig iron has spurted. Specifications on contracts are coming to suppliers steadily and new order volume is heavier. There is no surplus of iron on the market, especially with merchant supplies at Pittsburgh curtailed by the blowing out of a district stack for repairs. All nine district blast furnaces now are operating, Republic Steel Corp. last week blowing in its stack idled about six weeks ago for repairs.

Cincinnati—Specifications for pig iron for June delivery show continuance of the upward trend in demand. The melt throughout the district is heavier, but spotty. Rise in scrap prices is helping the pig iron market.

Buffalo — Indications point to a continuation of improved demand for merchant iron the next month. Movement of iron in May was the best for the year to date. Production holds at 100 per cent of capacity.

Pittsburgh — Some foundries will have to increase the ratio of cast scrap in melts to spread stocks of pig iron through the period the lone merchant foundry iron stack here is being relined. This unit is scheduled to be back in service in July and there will be an additional time lag before all four iron grades will be produced again. It is probable that initial output will be malleable iron.

Chicago—First mentions of premium priced pig iron are filtering through the foundry trade. One user has been offered foreign material at $20 above the recognized market. Stringency of supply has developed because of high level foundry activity, mounting cast scrap price and heavy use of hot metal by mills. Sellers shy away from use of the word "allocation," but nevertheless are doling out iron as best they can. Blast furnace operations are unchanged, 38 of the district's 42 stacks being active.

Birmingham — Increased demands from most foundries and general industrial activity is keeping merchant iron melters working at a high rate to meet current demands.

Canada . . .

Canada

Toronto, Ont.—Canadian pig iron production increased to 174,944 net tons in March from 157,200 tons in February and compared with 202,130 tons in March, 1949.

In the three months ended Mar. 31, 1950, pig iron output totaled 522,576 tons against 557,928 tons in the like period of 1949 and 483,840 tons in 1948.

Ferroalloys produced in March amounted to 17,157 tons compared with 9602 tons in February and 22,457 tons in March, 1949.

First-quarter production of ferroalloys totalled 36,720 tons against 66,101 tons in the 1949 period and 43,241 tons in 1948.

Production of steel ingots and castings in March amounted to 294,303 tons, 86.6 per cent of capacity, compared with 258,123 tons, or 84.1 per cent, for February and 298,461 tons in March, 1949.

In the first quarter this year, steel ingot production totaled 842,375 tons against 842,439 tons in the first quarter of 1949 and 782,398 tons in the 1948 period.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3900 tons, Dun & Bradstreet building, Church street, New York, to Bethlehem Steel Co.

1900 tons, bottling works addition, Schlitz Brewery, Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

880 tons, high school, Glens Falls, N. Y., to Ernst Iron Works Inc., Buffalo.

500 tons, Bonneville Power Administration substation, to Bethlehem Pacific Coast Steel Corp., Seattle, low $107,606.

490 tons, DuPont plant, Chattanooga, Tenn., to Virginia Bridge Co., Roanoke, Va.

475 tons, state bridge, Bucks county, Pennsylvania, through Keelor Construction Co., Perkiomenville, Pa., to Bethlehem Steel Co.

340 tons, state highway bridge, Sullivan county, New York, to American Bridge Co., Pittsburgh.

275 tons, apartment, 63rd drive and 64th avenue, Queens, New York, to Grand Iron Works, that city.

250 tons, King county, Washington Allentown bridge to Pacific Car & Foundry Co., Seattle; erection by Leckenby Structural Steel Co., Seattle.

240 tons, New York Central Railroad bridge, Gardenville, N. Y., to Bethlehem Steel Co.

230 tons, building, Gordon-Lacey Chemical Products Co., Hicksville, Long Island, to Schacht Steel Construction Inc., New York.

160 tons, high school, Newington, Conn., to City Iron Works, Hartford; Wadhams & May Co., Hartford, general contractor; Scherer Steel Co., Hartford, awarded 70 tons reinforcing steel.

160 tons, Contract No. 1, New Jersey turnpike bridge work, to Harris Structural Steel Co., New York.

140 tons, state bridge approach, Easton, Pa., to unnamed fabricator.

127 tons, incinerator plant, Waterbury, Conn., 77 tons structurals to New England Iron Works, Hartford, Conn.; 50 tons reinforcing bars to Concrete Steel Co., New York; F. H. McGraw Co., Hartford, general contractor.

120 tons, over-pass, Newcastle county, Delaware, through Conduit Foundation Co., Philadelphia, to American Bridge Co., Pittsburgh.

100 tons, Idaho state highway bridge, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, remodeling Seattle department store and other work, to Standard Steel Fabricating Co. Inc., Seattle.

STRUCTURAL STEEL PENDING

6000 tons, 38-story addition, Chrysler Bldg.,

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Lexington avenue and 42nd street; bids closed.

2200 tons, transmission towers for Bonneville Power Administration; Bethlehem Pacific Coast Steel Corp., Seattle, low.

1350 tons, Junior high school No. 125, Bronx, New York; bids closed May 24.

330 tons, hospital, Altoona, Pa.; Montgomery Construction Co., Grove City, Pa., low on general contract.

250 tons, store and warehouse, Sears Roebuck & Co., Steubenville, O.; general contract awarded to Seabright Construction Co., Wheeling, W. Va.

173 tons, state bridge, Allegheny county, Pennsylvania; bids closed June 16.

150 tons, plant addition, Armstrong Cork Co., South Braintree, Mass.; bids in.

141 tons, widening state bridges, Route 25, Section 34-K, Newark, N. J.; bids June 8.

118 tons, state overpass, Route S-3, Section 3, Clifton, N. J.; bids June 8.

100 tons, reconstruction, state bridge, Buckland, Mass.; bids May 16, Boston.

Unstated, 145-ton gantry crane for McNary dam; Willamette Iron & Steel Corp., Portland, Oreg., low to U. S. Engineer, Walla Walla, Wash., $194,639; 30-ton gantry crane, Judson-Pacific-Murphy Co., Emeryville, Calif., low $53,511.

Unstated, 125-ton traveling crane for Canyon Ferry, Mont., power plant; bids to Bureau of Reclamation, Denver, June 13.

Unstated, fixed wheel gates for Canyon Ferry penstock; bids to Bureau of Reclamation, Denver, June 15.

Unstated, steel frame pump house, 150-ton crane, switchyard and other equipment for Quincy pumping plant; bids to Bureau of Reclamation, Ephrata, Wash., June 13.

Unstated, trashracks, gates, wheels, stoplogs, etc. for Canyon Ferry and Hungry Horse power projects; Bureau of Reclamation to issue bid call late May.

REINFORCING BARS . . .

REINFORCING BARS PLACED

550 tons, Admiral Terrace housing project, Providence, R. I., to Plantations Steel Co., Providence; E. Turgeon Construction Co., general contractor; Providence Steel & Iron Co., awarded 75 tons structural steel.

375 tons, flood control project, Hoosic river, North Adams, Mass., to Truscon Steel Co., Boston; Petricca Construction Co., Pittsfield, Mass., general contractor.

300 tons, 58 family quarters, military installation, Anchorage, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Patti-MacDonald Co. general contractor.

100 tons, approaches to Wenatchee state bridge, Washington state, to Northwest Steel Rolling Mills Inc., Seattle; Henry Hagman, Cashmere, Wash., general contractor.

100 tons, biology building, Holy Cross College, Worcester, Mass., to U. S. Steel Supply Co., Boston; Charles Logue Building Co., Boston, general contractor; Groisser & Shlager Iron Works, Somerville, Mass., awarded 60 tons structural steel.

100 tons, additional wing building, Memorial Hospital, Palmer, Mass., to Northern Steel Co., Medford, Mass.; William Belin, Athol, Mass., general contractor.

REINFORCING BARS PENDING

Unstated, addition to St. Joseph's Hospital, Fairbanks, Alaska; general contractor to Morrison, Knudsen Co., low $942,560.

PLATES . . .

PLATES PLACED

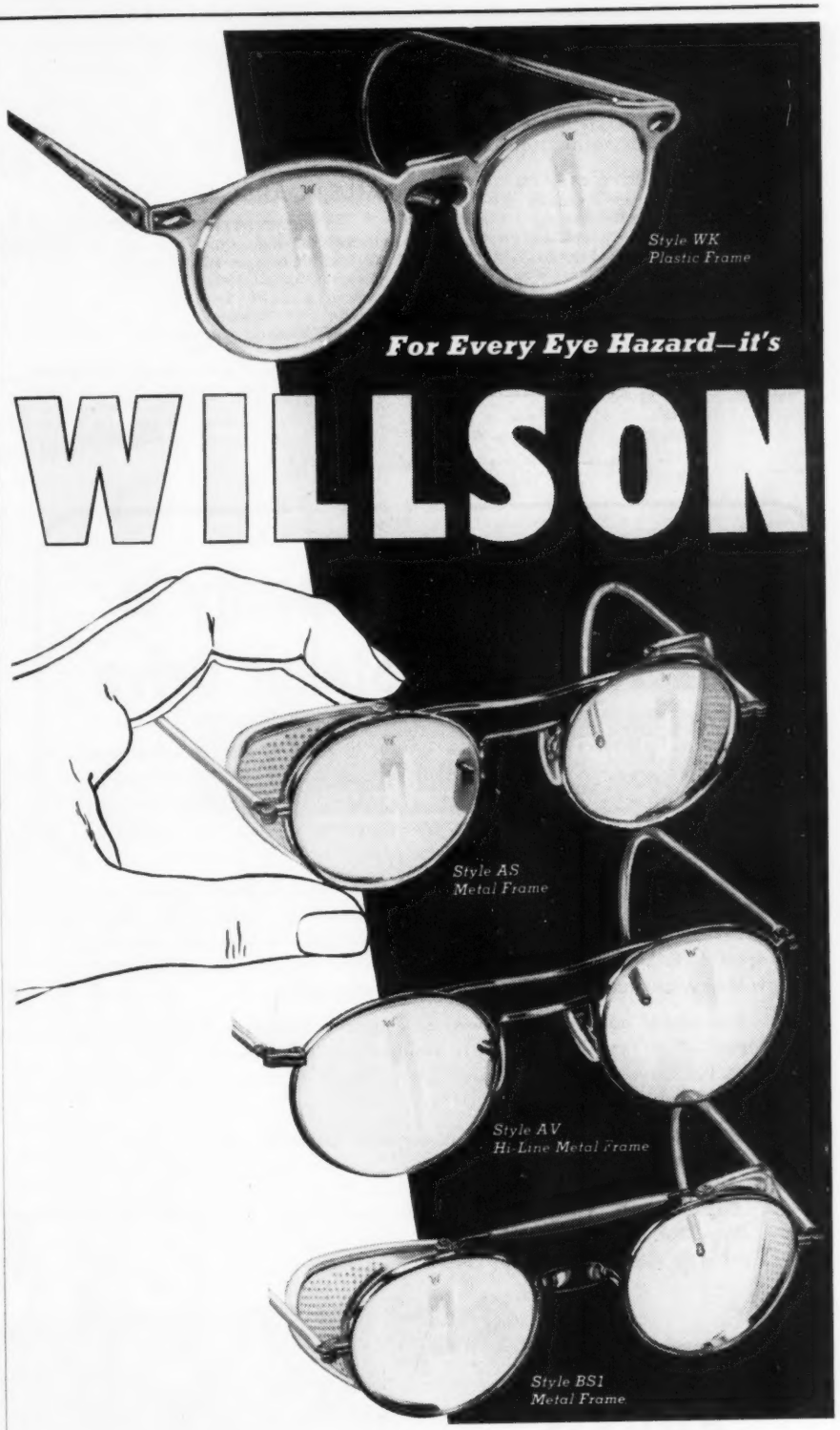
6250 tons, tanks, Texas Co., New York, 3150 tons going to the Chicago Bridge & Iron Works, Chicago, and 3100 tons to General American Transportation Corp., Chicago.

3400 tons, nine tanks, Esso Standard Oil Co., Baltimore, to Bethlehem Steel Co.

3120 tons, eight tanks, Atlantic Coast Terminals Inc., Port Newark, N. J., to Chicago Bridge & Iron Works, Chicago.

2385 tons, hull plates, Navy, various deliveries, four contracts, to Lukens Steel Co., Coatesville, Pa.

1278 tons, tanks, Esso Standard Oil Co., New York, 538 tons to Graver Tank & Mfg. Co.



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Inc., East Chicago, Ind., 401 tons to Chicago Bridge & Iron Works, Chicago, and 339 tons to General American Transportation Co., Chicago.

PIPE . . .

CAST IRON PIPE PLACED

750 tons, 16 to 3 in. standard bell and spigot, system improvements, Everett, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

100 tons, feeder line mains, Wolf Creek, Oregon., to Pacific States Cast Iron Pipe Co., Portland, Oreg.

CAST IRON PIPE PENDING

150 tons, 20 and 8 in., system improvement, Tacoma, Wash.; general contract to Valley Construction Co., Seattle.

Unstated, district No. 7, King county, 8 and 6 in. and fittings; bids to 8800 Bothell Way, Seattle, May 31.

Unstated, 6 and 4 in.; bids to Oswego, Oreg., May 29.

Unstated, also steel reservoir and other equipment; bids to U. S. naval base, Bremerton, Wash., June 1.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Baltimore & Ohio, thirty-four 1500-hp diesel-electric units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Bessemer & Lake Erie Railroad, 14 diesel-electric road locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Boston & Maine, 24 diesel-electric locomotives; eight 1500-hp road switchers and four 1500-hp freight units going to Electro-Motive Division, General Motors Corp., La Grange, Ill., and eight 1000-hp switchers and four 660-hp switchers going to American Locomotive Co., New York.

RAILROAD CARS PLACED

Pennsylvania-Reading Seashore Lines, six self-propelled rail diesel cars, to the Budd Co., Philadelphia.

No Lost Pump Capacity In This Hydraulic Stoker Drive

As the A. E. Perfect Spread Stoker's travelling grate steadily serves up flaming coals to the boiler, potentially dangerous heat in the hydraulic drive (illustrated) becomes a threat. For, under excessive temperatures, hydraulic oil becomes less viscous, causing pump slippage . . . *retarding the required movement of the grate.*

To assure full pump capacity, therefore, as well as guard against oil breakdown, American Engineering Co. furnishes Ross Type BCF Exchangers as standard, factory installed components. All who depend upon A. E. Stokers for power are thus assured that the hydraulic fluid will be maintained at safe and effective temperatures.

For simple adaptation to new or existing equipment, copper and copper alloy Type BCFs are fully standardized in a wide assortment of sizes. For easy ordering and immediate delivery, Type BCFs are stocked as shelf goods.

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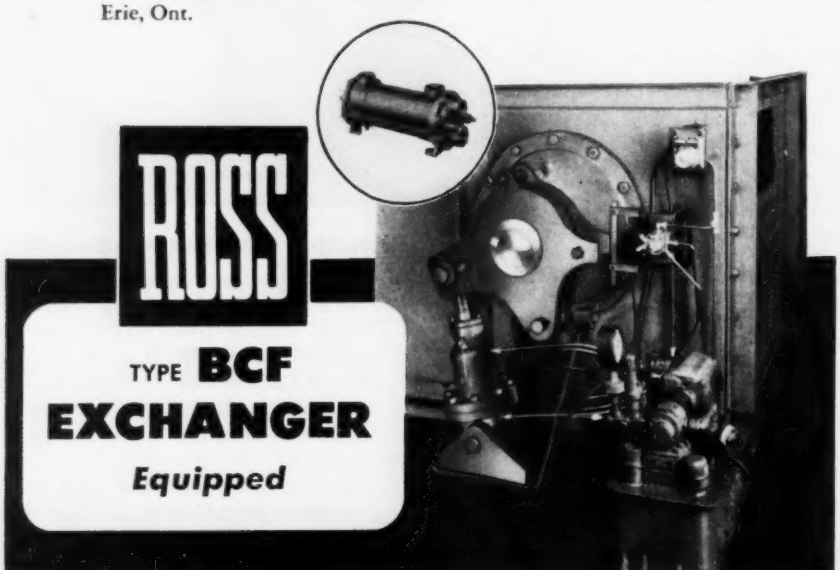

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FERROALLOYS

(*Continued from Page 99*)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., SMxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx.

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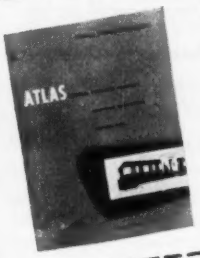

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3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

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Vanadium Alloys

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Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., frt allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered, Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min. C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed. ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered, Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

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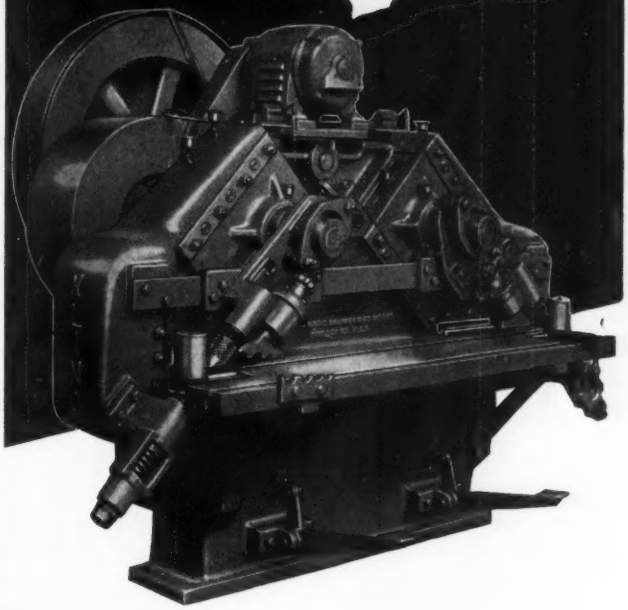

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

Arkansas

Arkansas Power & Light Co., Simmons National Bldg., Pine Bluff, Ark., awarded the general contract for the erection of an office building at Sixth and Pine streets to the Ebasco Services Inc., 2 Rector St., New York. Estimated cost is $1 million. Selligman & Reed, National Bldg., Pine Bluff, is the architect.

California

Sears, Roebuck & Co. has started construction of a $653,000 retail store building at San Mateo, a suburb of San Francisco. It will be a two-story air-conditioned structure. Completion is scheduled next year.

California

McKesson & Robbins Inc., has begun construction of a new $750,000 office and distributing building in Sacramento, Calif. Construction will be steel and concrete and the structure will be air-conditioned.

California

Calso Water Co., bottler of mineral waters, is starting construction of a structure in San Francisco to house production, warehousing and distributing operations. Total cost of the expansion will be $275,000.

Connecticut

G. W. Bush Co., West Hartford, Conn., is appointed exclusive New England distributor of precision gears and flexible gear couplings by the **Sier-Bath Gear & Pump Co. Inc.,** North Bergen, N. J. The G. W. Bush Co. was formerly the Power Transmission Division of **Hartford Special Machinery Co.** Mr. Bush became owner of the division in March, 1950.

Delaware

Porta-Lite Mfg. Co. Inc., machinery, has been chartered by the corporation department of the secretary of state's office, Dover, Del. Prentice-Hall Corporation System Inc., Dover, is serving as the principal office.

Delaware

Growers Aluminum Supply Co.—containers—has been chartered by the state of Delaware. Corporation Trust Co., Wilmington, Del., is the principal office.

District of Columbia

Large new public works projects are in the "advance planning" stage as a result of loans by the **General Services Administration.** Estimated cost of some of the larger ones are: Medical school at University of Florida, Gainesville, Fla., $11,160,000; sewage facilities, Savannah, Ga., $2 million; sewage facilities, Decatur, Ill., $2 million; parking garage, Grand Rapids, Mich., $1,250,000; library for Regents of University System, Atlanta, Ga., $1,730,000; biology building, University of Illinois, Urbana, Ill., $5 million; pharmacy building, University of Illinois, Chicago, $6 million; dams and power houses, Brazos River Conservation and Reclamation District in Jones county, Tex., $10,590,000; bridges, San Diego, Calif., $2,286,000; garbage disposal facilities, Hartford, Conn., $1 million; sewage facilities, Salisbury, Md., $1,554,000; medical science building, University of Michigan, Ann Arbor, Mich., $6 million; library addition, East Lansing, Mich., $3,025,000; post office, Anderson, Ind., $1,220,000; post office, Baltimore, $2,300,000; post office, Methuen, Mass., $1,290,000; post office, Kingsport, Tenn., $1,050,000. Many smaller projects also have been listed.

Florida

Hudson Pulp & Paper Corp., Palatka, Fla., will start a $10 million expansion program early in June.

Iowa

Swift & Co., Chicago, awards the contract for a $500,000 plant building at its Sioux City, Iowa, branch to H. S. Holtz Construction Co., 2121 E. Fourth St., Sioux City.

Illinois

Tractomotive Corp., County Line road, Deerfield, Ill., awards the general contract for construction of an addition to its factory to Robert G. Regan Co., 25 N. Ottawa St., Joliet, Ill., at $180,000.

Illinois

J. W. Johnson Co., Randolph and Eastern streets, Bellwood, Ill., awards the general contract for a factory and office building to J. Emil Anderson Co., 1811 W. Balmoral St., Chicago.

Illinois

Denton & Anderson Co., Chicago representative of Taylor-Winfield Corp., Warren, O., has moved to 9 S. Clinton St., Chicago 6.

Kentucky

General Mills Inc., Minneapolis, plans to build a $1 million grain elevator and flour plant southwest of Louisville, Ky.

Massachusetts

Firestone Tire & Rubber Co., Akron, is launching another expansion of its foam rubber production capacity at Fall River, Mass., the fifth since the war. A $2.5 million plant will be under construction in June and is scheduled for completion in six months. Firestone completed a $2 million expansion of foam rubber facilities in that city last year. The new plant will adjoin the 1949 addition.

Michigan

Apex Chemical Mfg. Corp., Detroit—alkali and emulsion cleaners—was appointed distributor by **Optimus Equipment Co.,** Matawan, N. J. Joel N. Cooper is named sales manager of the industrial cleaning and chemical sales department of Apex.

Missouri

Union Electric Co. of Missouri awards the contract for its $2 million service warehouse and office to be erected at Gratiot and 18th streets, St. Louis, to the Woermann Construction Co., 3800 W. Pine Blvd., St. Louis. The company recently awarded a contract to United Engineers & Constructors Inc., 1401 Arch St., Philadelphia, for designing and erecting a power generating plant building in St. Louis. This latter building, to cost about $2,521,500 exclusive of equipment, is the first unit of the $26 million power generating plant for Union Electric at that point.

Missouri

Barry-Wehmiller Machinery Co., St.

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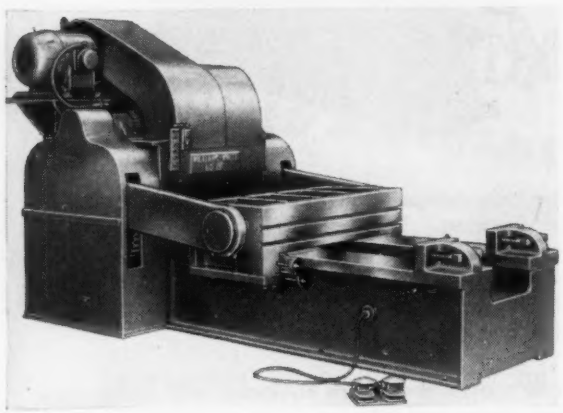

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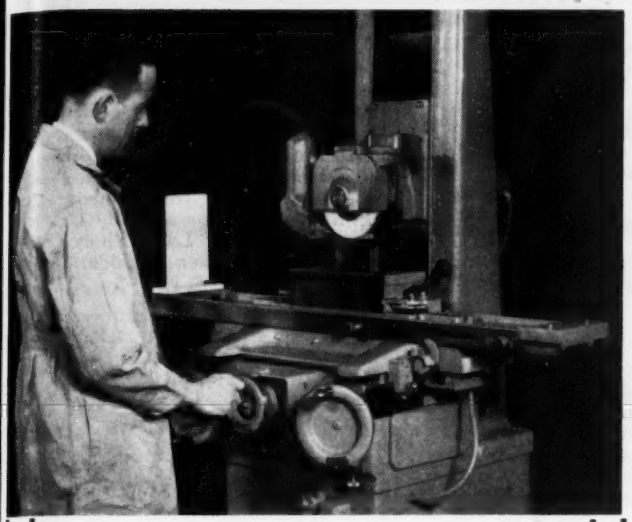

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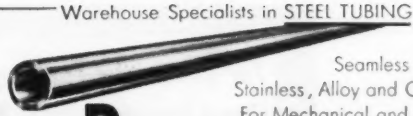

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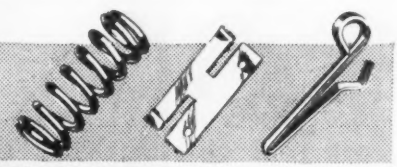

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Louis, awards a contract to **Fruin-Colnon Contracting Co.**, that city, for erection of an office and laboratory building to be erected at 4658 Rosalie St., adjacent to the company's present plant. The building will cost about $250,000. Harley, Ellington & Day, Detroit, is the architect.

Missouri

Hussman Refrigeration Inc., St. Louis, awards the contract for construction of a warehouse building to Fruin-Colnon Contracting Co., that city. The building, to be erected on N. Broadway between Morin and E. Taylor avenue, will cost about $600,000.

Missouri

Englander Co. Inc., Chicago, will start work soon on a $200,000 plant in St. Louis for manufacture of mattresses.

New York

BMC Manufacturing Corp., Binghamton, N. Y., has purchased a vacant plant at 319 Court St. where the firm will expand its operations. The main BMC plant has about 60,000 sq ft of floor space; the building just purchased, about 30,000 sq ft.

New York

Hudson Maintenance Corp. moves its offices to 38 Park Row, New York 7.

New York

Hauser Machine Tool Corp., 30 Park Ave., Manhasset, N. Y., is appointed exclusive United States sales and service representative for **Safag, S. A.**, Bienne, Switzerland, manufacturer of high-speed, high-precision machinery.

New York

Windom Machine & Tool Co. has been established on Lake avenue, Blasdell, N. Y., by Peter Kelzach.

North Carolina

Directors of **Farmers Cooperative Exchange,** M. G. Mann, Raleigh, N. C., general manager, approves plans for a $250,000 fertilizer plant at Lumberton, N. C.

Ohio

Controlling stock of **H. K. Ferguson Co.,** industrial engineer and builder, has been purchased by **Morrison-Knudsen Co. Inc.,** both of Cleveland. Otto F. Sieder will continue as executive vice president and general manager of the Ferguson company and there will be no change in the management, personnel or policy of the company, the announcement said.

Ohio

Electric Products Co., Cleveland, appoints **Klass Co.,** Minneapolis, as its representative in Minnesota, N. Dakota, S. Dakota, and the western counties of Wisconsin.

Pennsylvania

John S. Barnes Corp., Rockford, Ill., opens a Philadelphia sales office to be operated by **Ernest A. Isberg & Co.,** Swarthmore, Pa.

Pennsylvania

Radio tube plant of **Sylvania Electric Products Inc.,** New York, in Altoona, Pa., which closed last July, will be reopened on a limited basis for a temporary period. Assembly operations will be conducted.

Pennsylvania

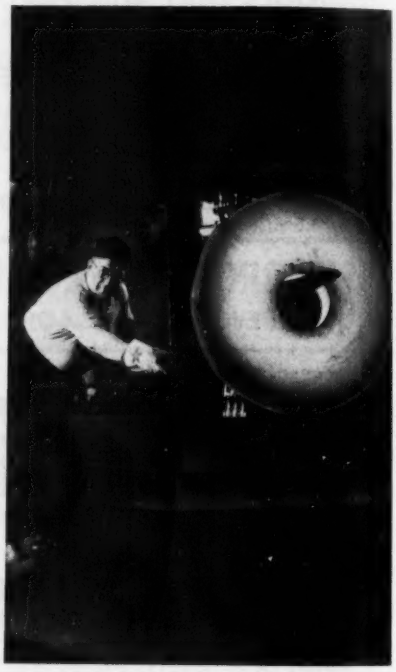
Dumas Steel Corp., Pittsburgh, expands its national organization with the opening of warehouse facilities at 9630 Greeley, Detroit 11. The warehouse is equipped for shearing and pickling both strip and coil, and will be represented by **Lake Shore Steel Inc.,** Robert L. Rosen, president.

Pennsylvania

Process Industries Engineers Inc., 5941 Baum Blvd., Pittsburgh, formed a manufacturing division to accommodate the demands for fabrication of specially engineered equipment for the chemical, petroleum, food and allied industries.

Washington

Leckenby Structural Steel Co., Seattle, is appointed western Washington agents for Stran-Steel by Great Lakes Steel Corp., Ecorse, Mich.



BLACKSMITH'S DOUGHNUT: Right out of the furnace comes what is probably the world's largest (and most indigestible) "doughnut." It was produced by Kropp Forge Co., Chicago, in a demonstration of the modern blacksmith's skill. The doughnut here is the first stage of what eventually will be a mammoth ring gear. President Roy A. Kropp says production of forgings for everything from tractor to jet engine parts continues at a wartime pace

Wisconsin

General Machinery Division, **Allis-Chalmers Mfg. Co.,** Milwaukee, appointed **Nelson Supply Co. Inc.,** Racine, Wis.; **Romanoff Motor Service Inc.,** Toledo, O.; and **Central Kansas Electric Machinery Co.,** Salina, Kans.; as dealers.

Canada

General Steel Wares will erect an addition to its enameling plant at London, Ont., at a cost of $350,000. Work will begin immediately.

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Wittek Roll Feeds are made in standard models to meet every requirement in the automatic feeding of strip stock to punch presses or press brakes. The distinguishing feature is their simple and economical method of operation which does away with complicated parts thereby assuring *speed* and *accuracy* in the feeding of various kinds and thicknesses of material.
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